

In an urbanizing landscape, what does the scientific literature tell us about accomodating fish and wildlife near streams?



# This approach uses the following

- Rely on scientific literature
- Compares **Unimpacted** buffer distances from various studies
- Identifies some ecological concepts for wildlife
- Offers a framework for approaching fish and wildlife issues in land use planning







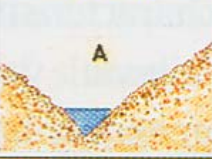
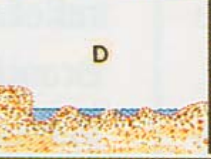
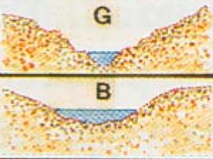
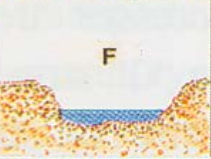
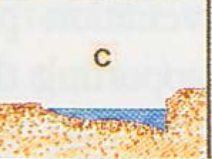
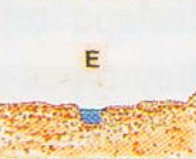
# Scientific Literature

- 1<sup>st</sup> Level - Original Research – typically specific resource
- 2<sup>nd</sup> Level – Review of many research papers – summary document
- 3<sup>rd</sup> Level (this presentation) – Review of review papers – Opinions of many authors that reviewed original research papers, put into a visual format.

# George Bernard Shaw:

If all economists were laid end to end, they would not reach a conclusion.

If all **biologists** were laid end to end, they would not reach a conclusion.

| STREAM TYPE        | A  | D  | B & G   | F  | C  | E  |
|--------------------|--|--|---|--|--|--|
| PLAN VIEW          |   |   |    |   |   |   |
| CROSS SECTION VIEW |  |  |  |  |  |  |
| AVERAGE VALUES     | 1.5  | 1.1  | 3.7   | 5.3  | 11.4   | 24.2   |
| RANGE              | 1 - 3  | 1 - 2  | 2 - 8   | 2 - 10   | 4 - 20   | 20 - 40  |

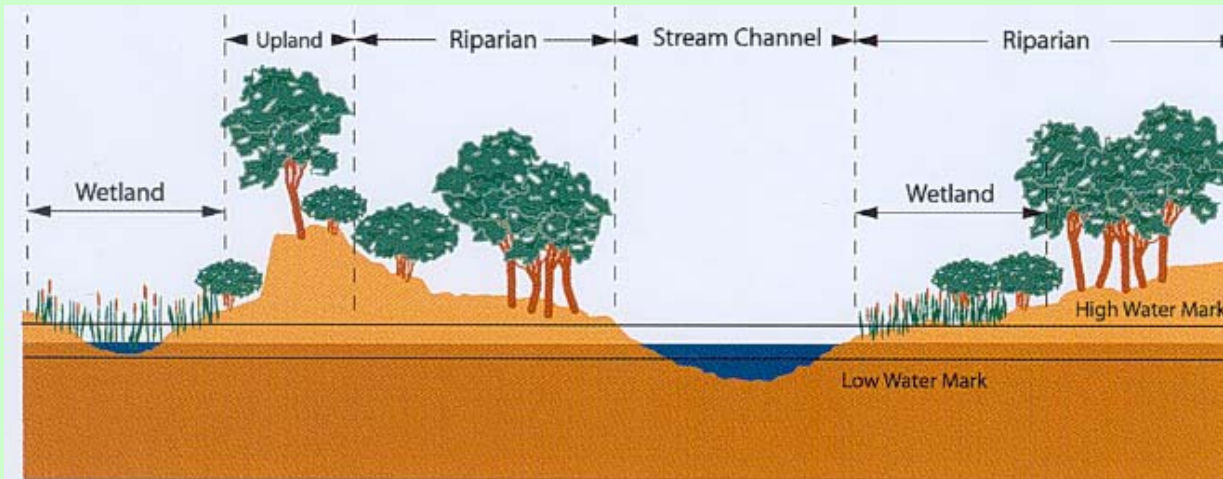




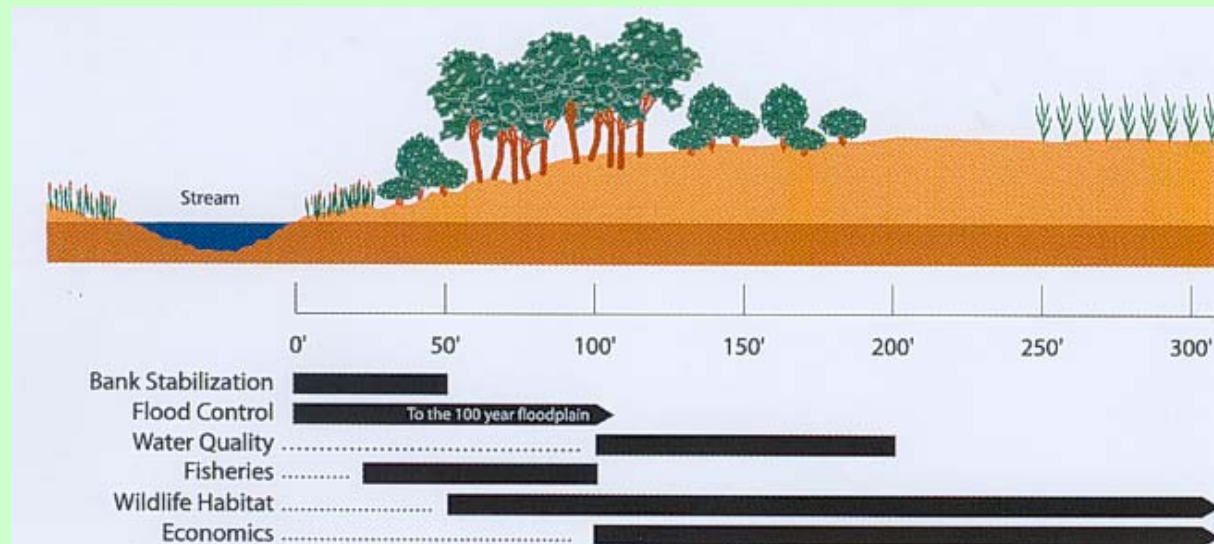
# Resources

- Water Quality and Temperature
- Riparian (Ecosystem) Processes
- Fish Habitat
- Wildlife Habitat



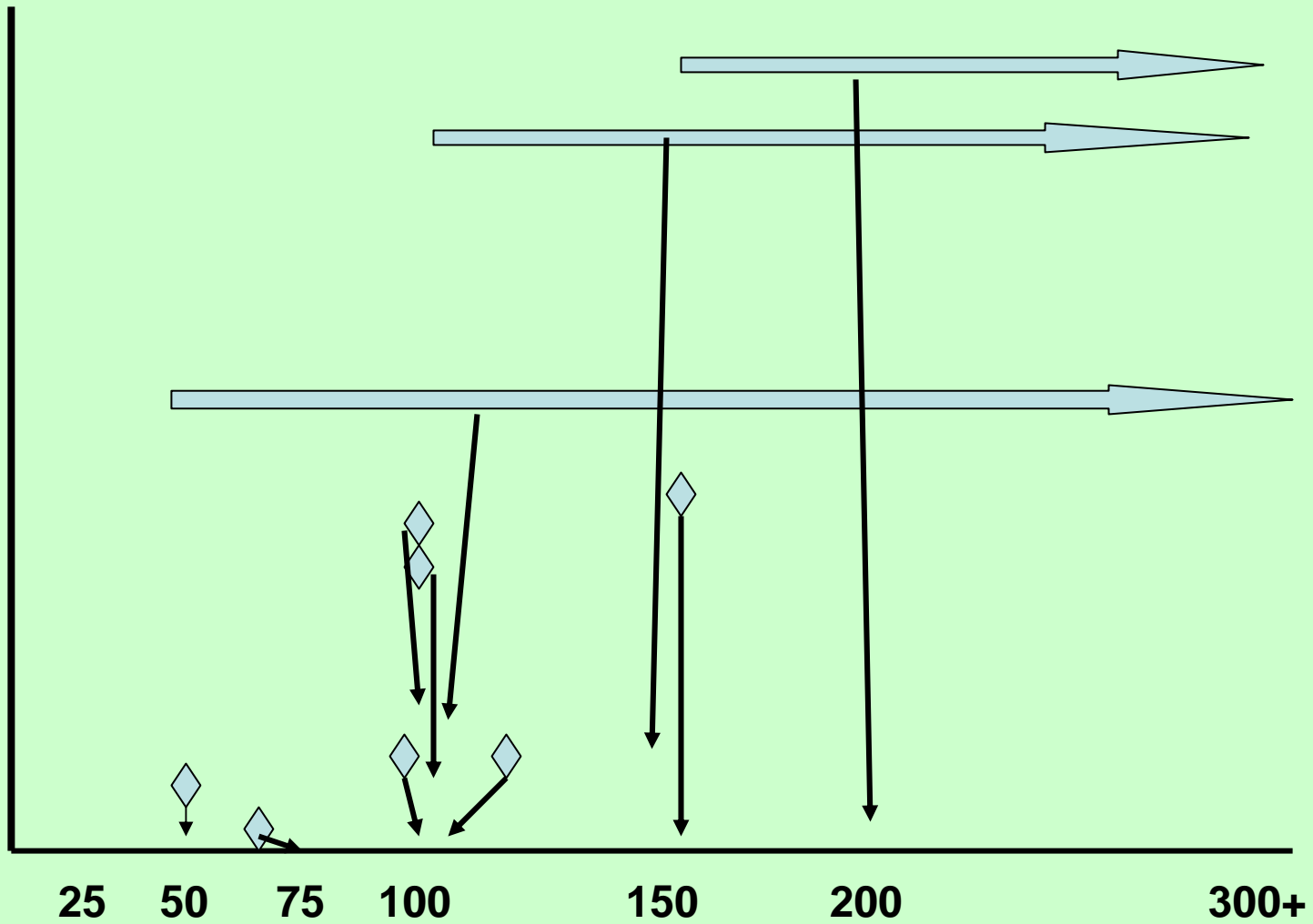


*Figure 1. The relationship of riparian areas to wetlands.*



*Figure 4. Buffer strip recommendations based on resource protection goals (CRJC, 1998).*

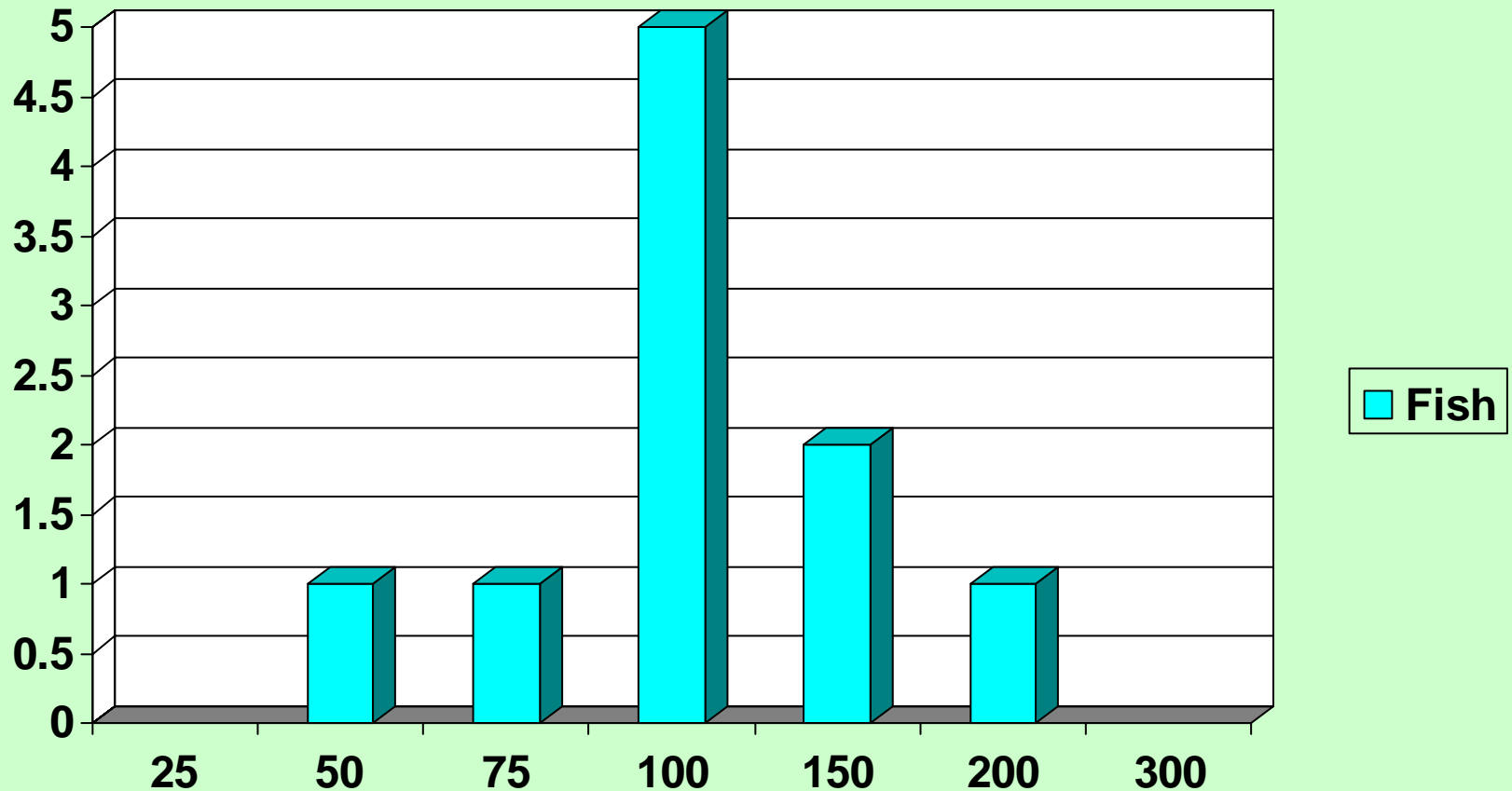


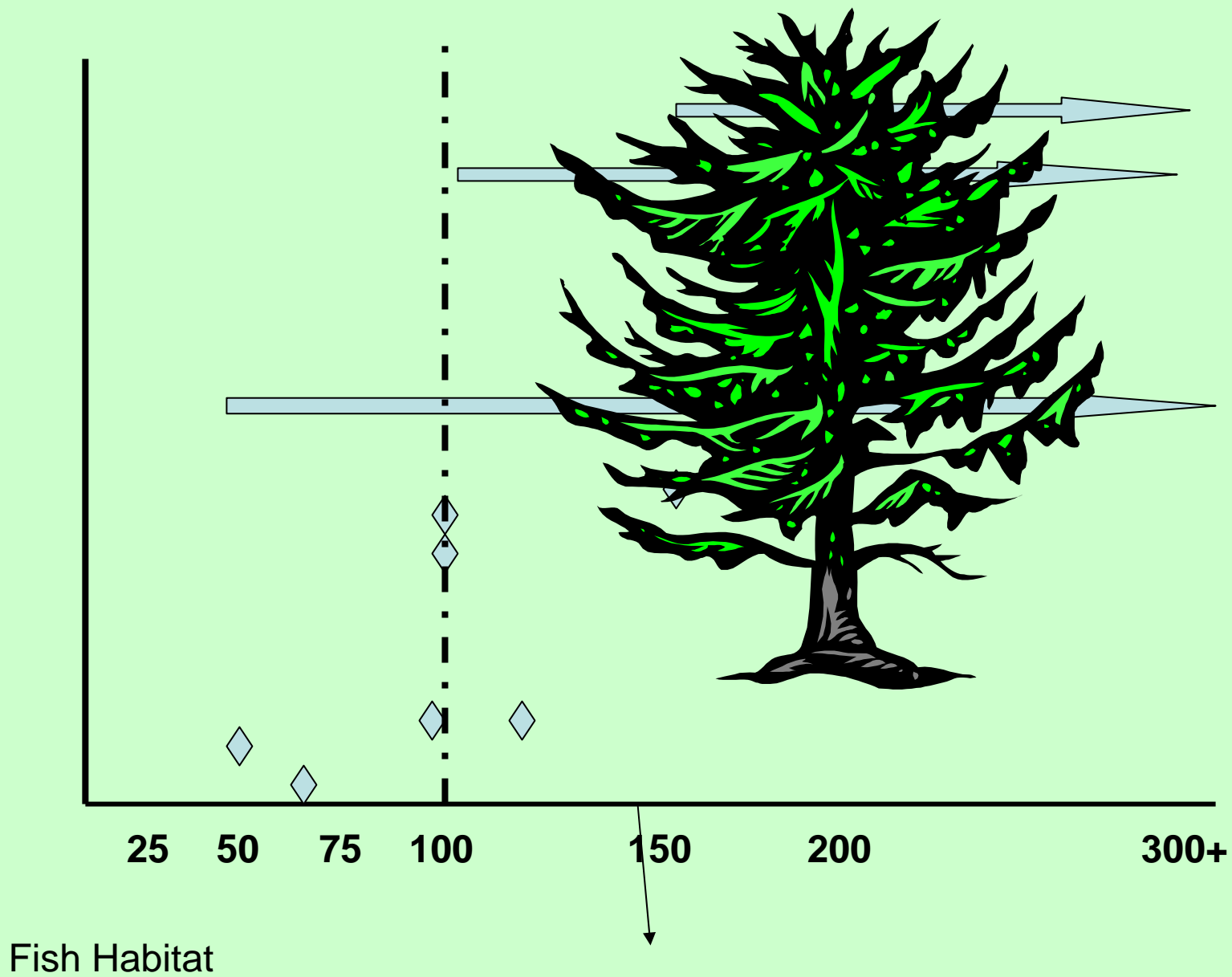


Fish Habitat

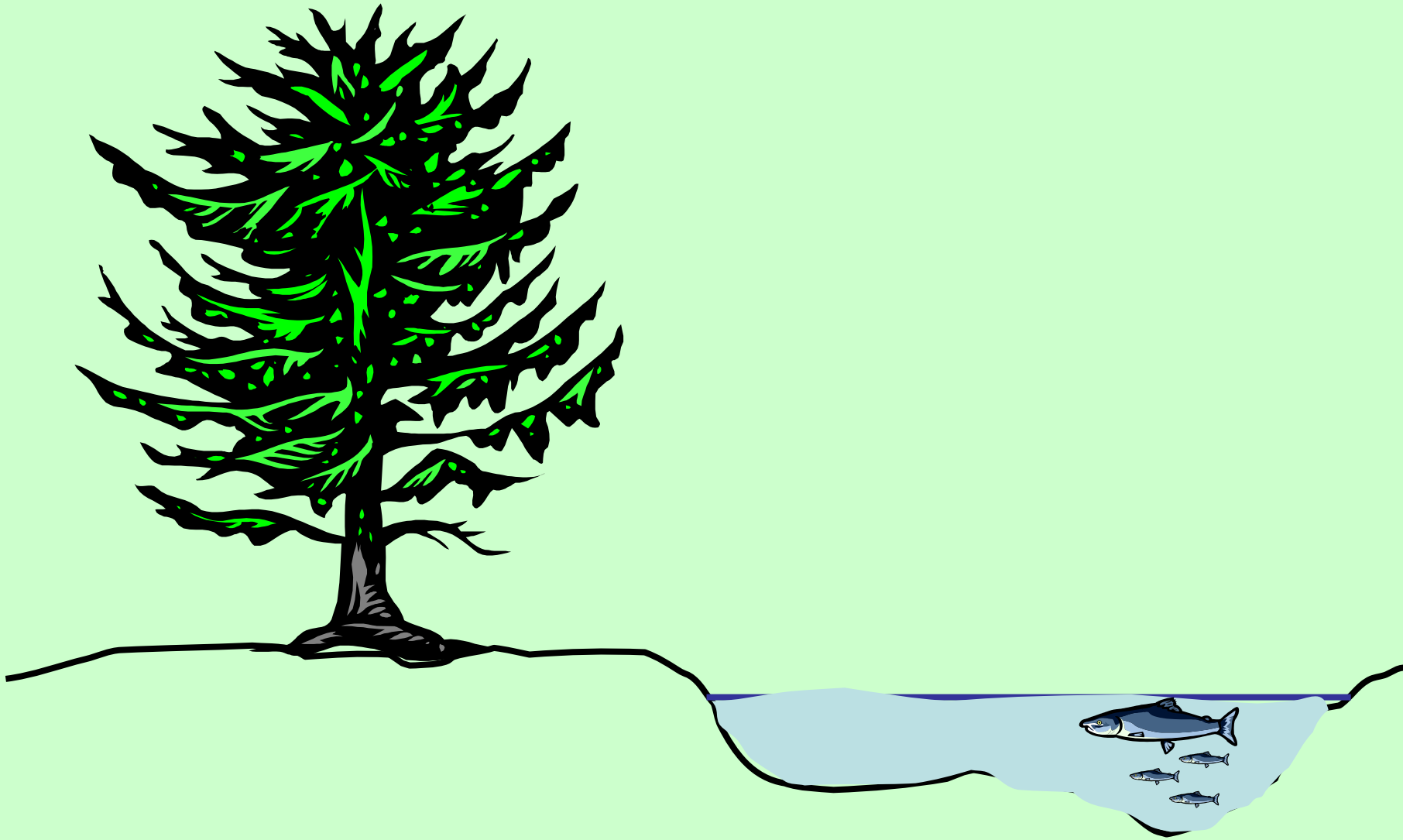
# Fish Habitat

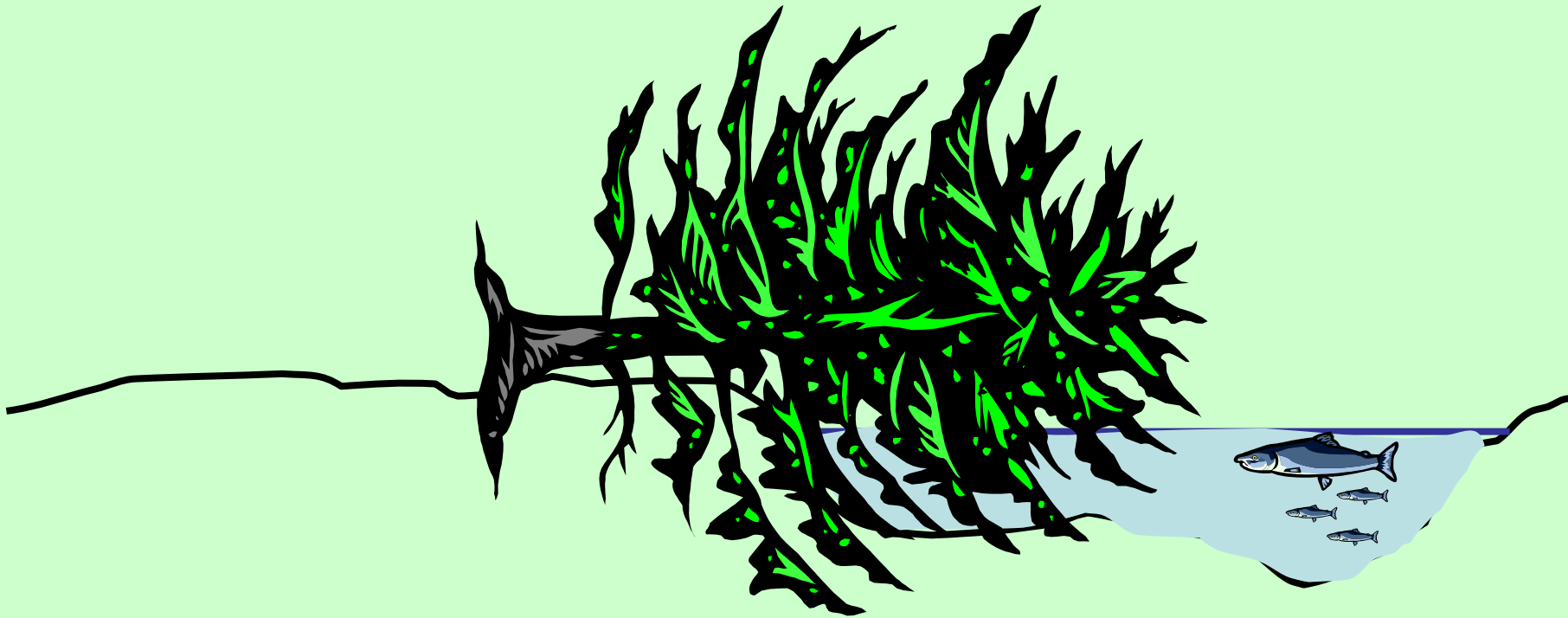
## Buffer Width Requirement

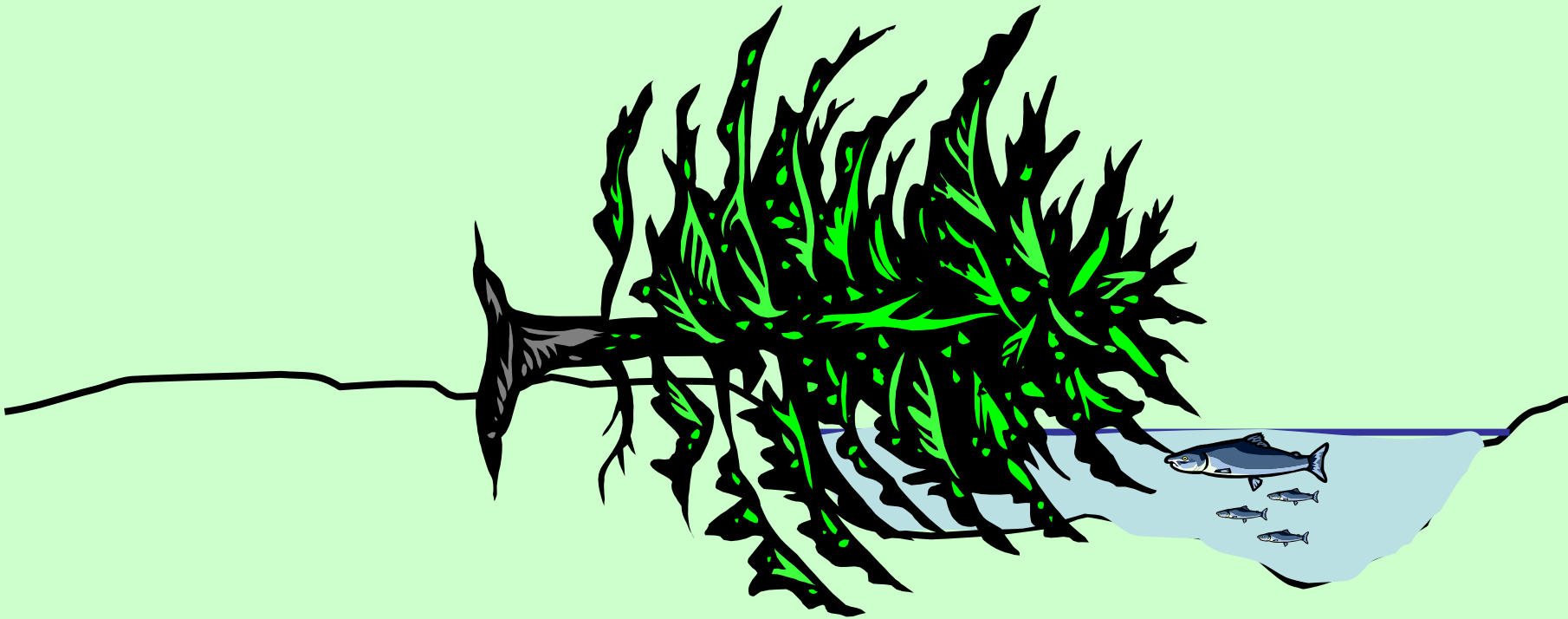








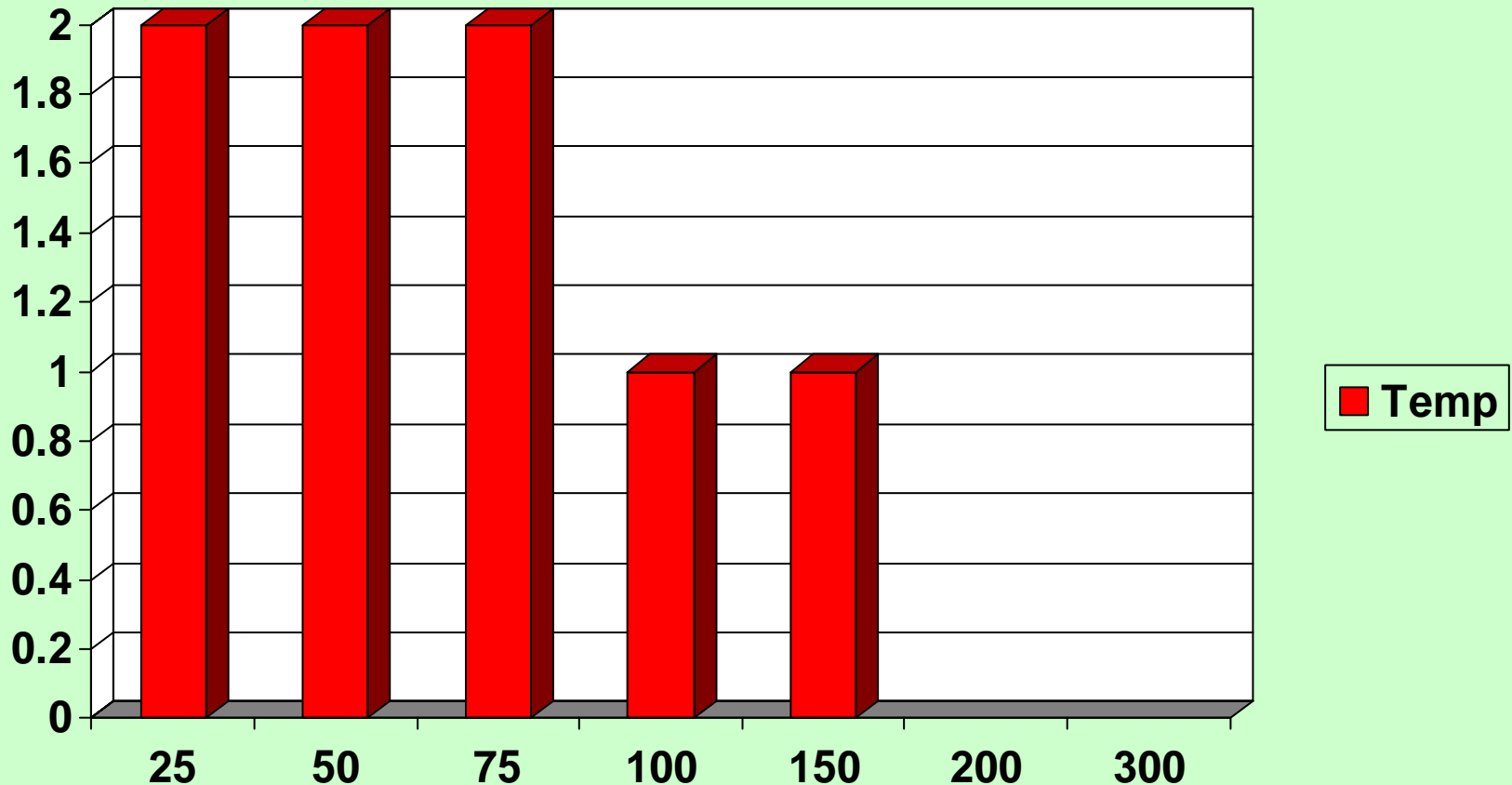






# Water Temperature

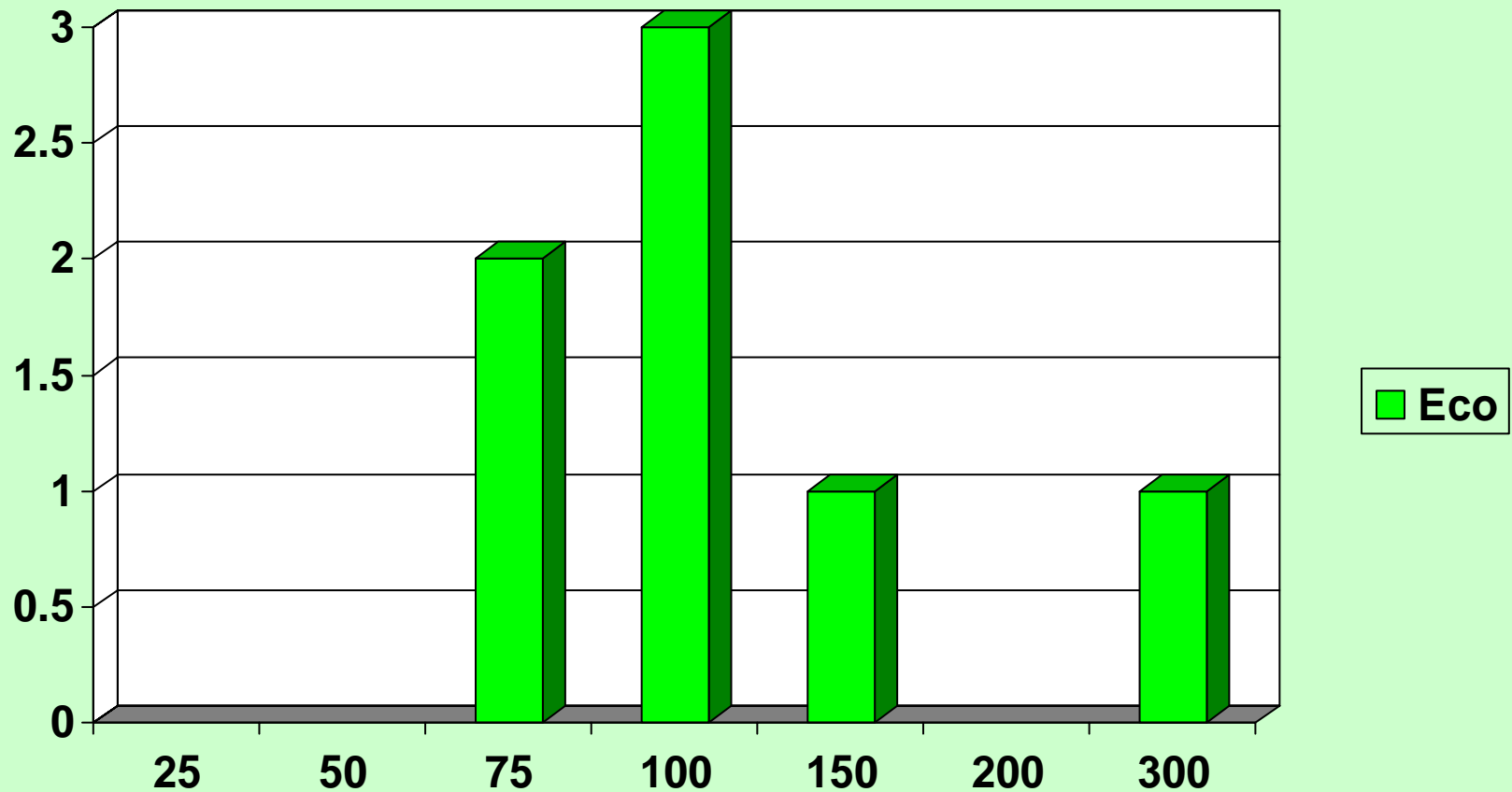
## Buffer Width Requirement





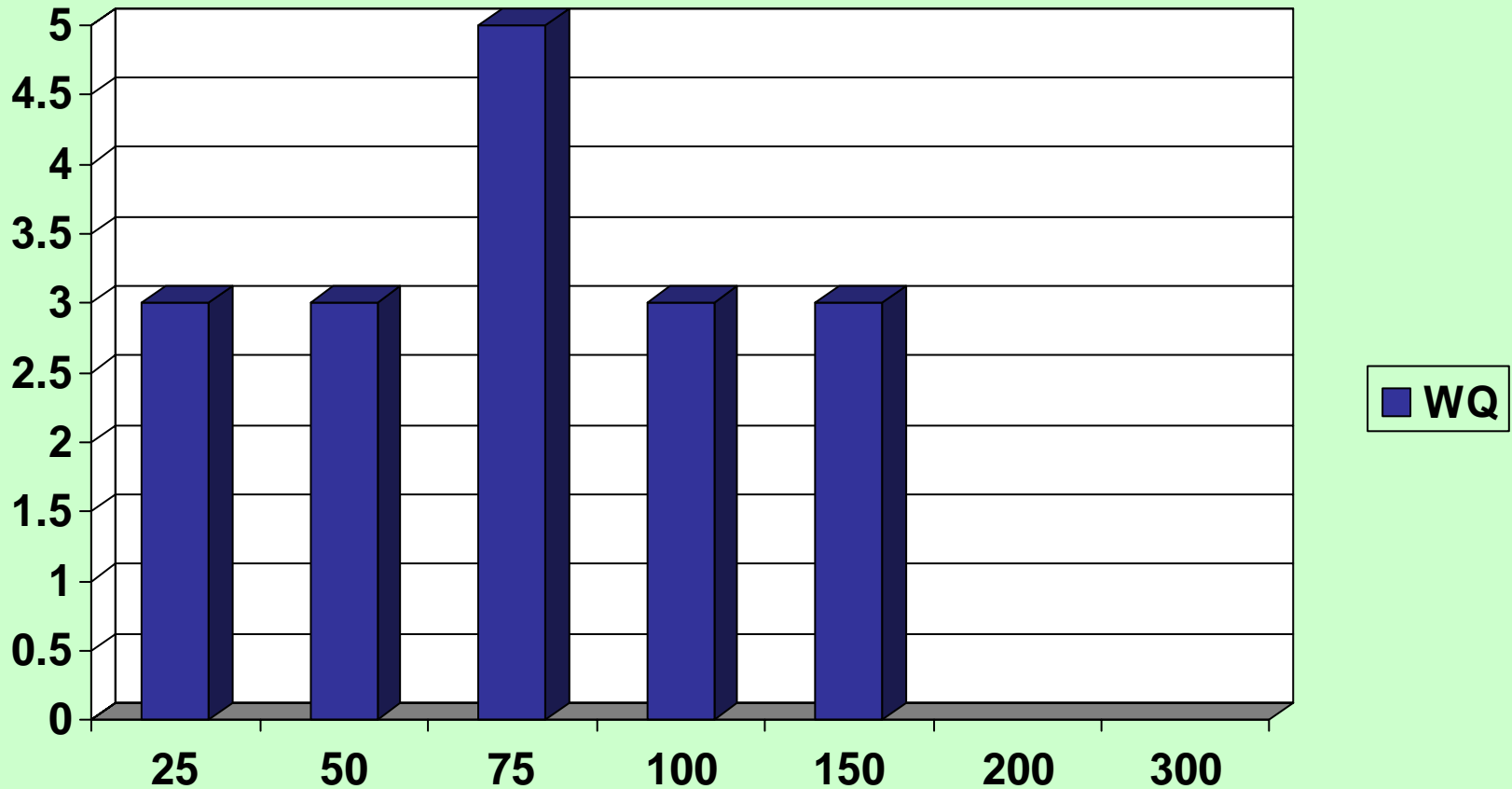
# Ecosystem

## Buffer Width Requirement



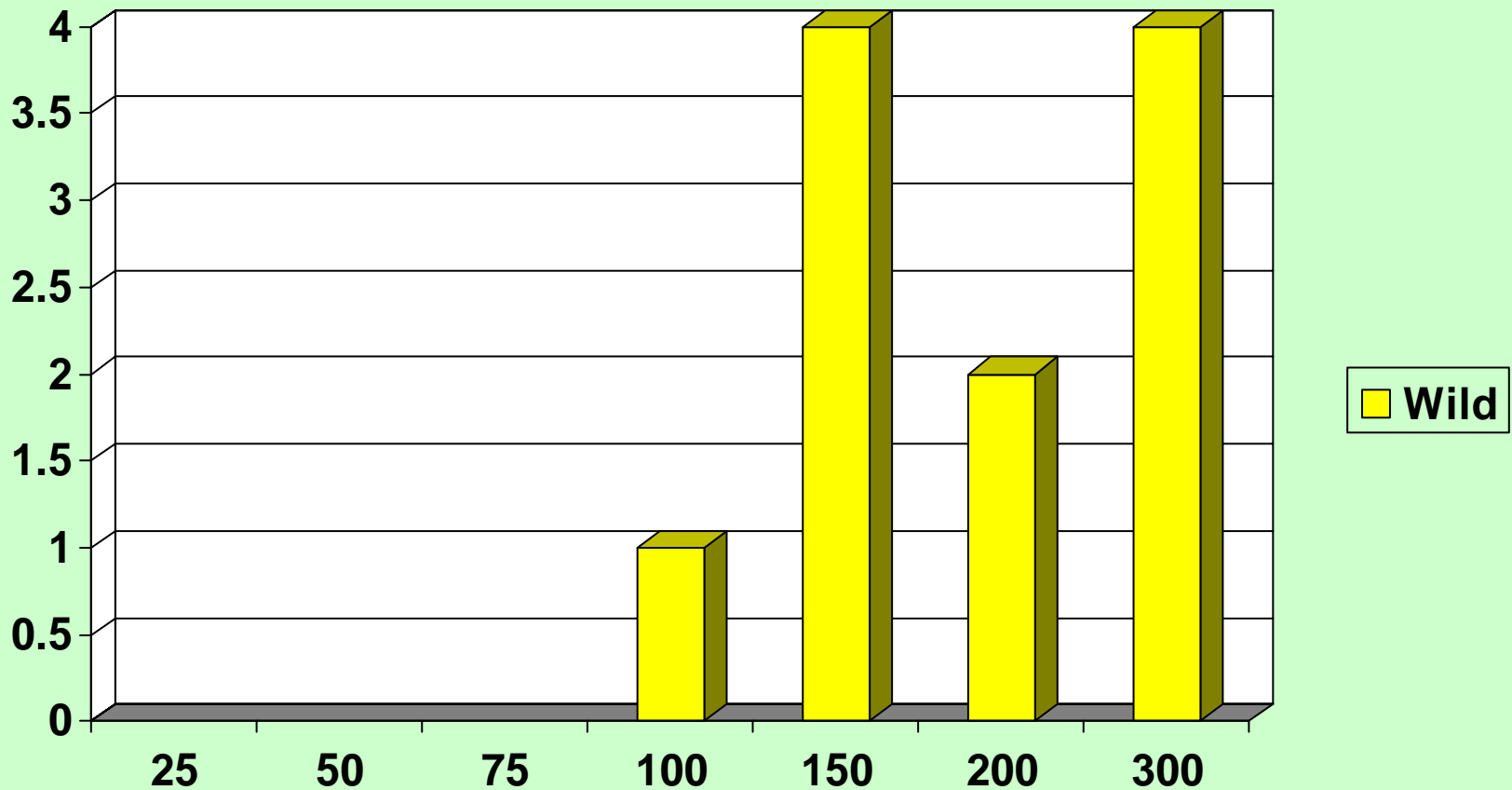
# Water Quality

## Buffer Width Requirement



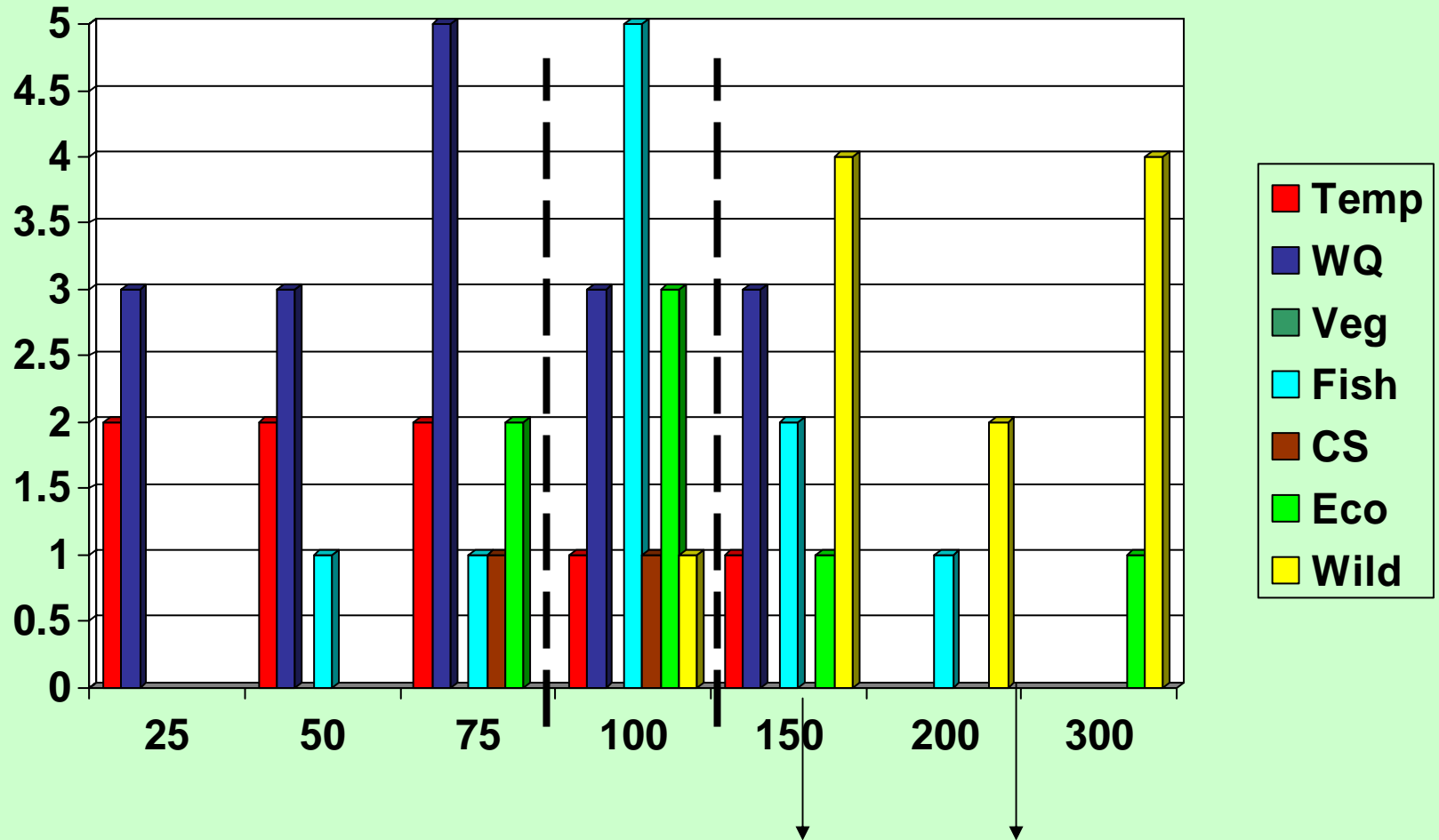
# Wildlife

## Buffer Width Requirement



# Various Resources

## Buffer Width Requirement

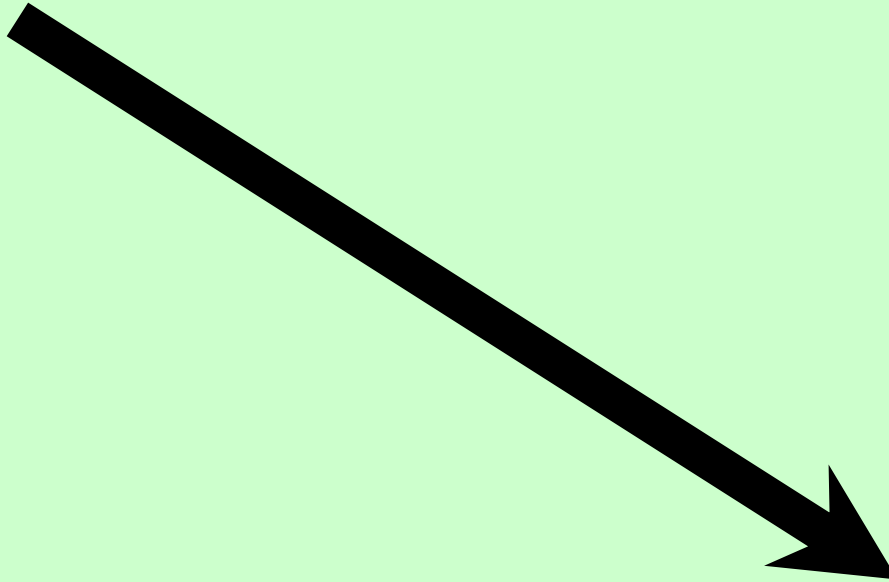


# General Statements,

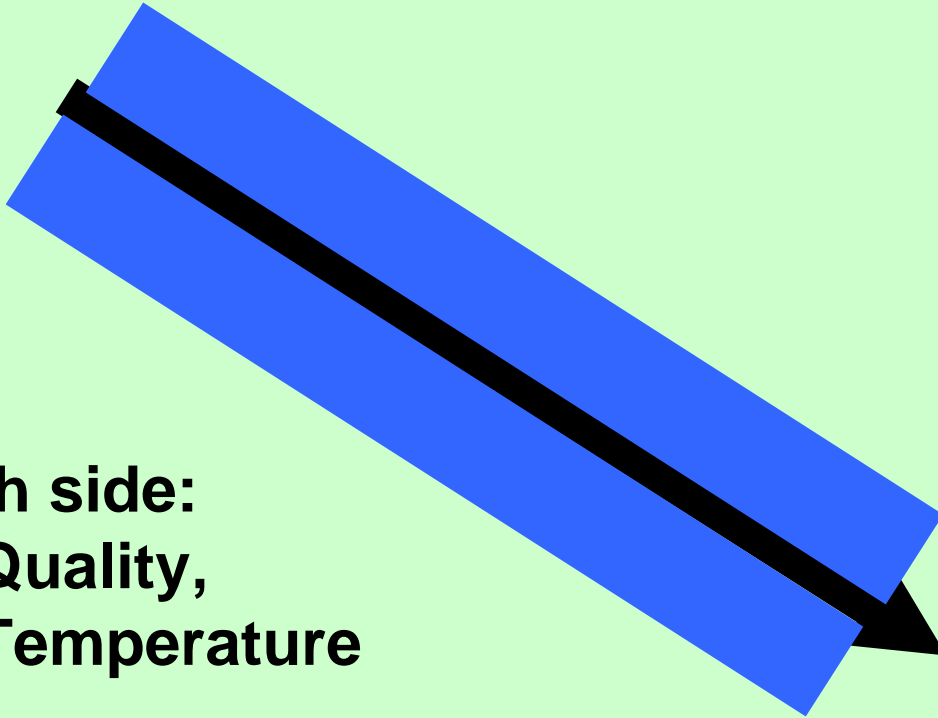
- From our review, it appears buffers less than 33' provide little if any maintenance of various riparian functions
- Buffers of less than 50' width are generally ineffective in protecting wetlands
- 100' fixed width is recommended for local governments that find it impractical to administer a variable width buffer
- **Washington State recommended 150-250' or 100 year floodplain to protect riparian function, based on Washington Dept of Fish and Wildlife review of nearly 1500 articles.**



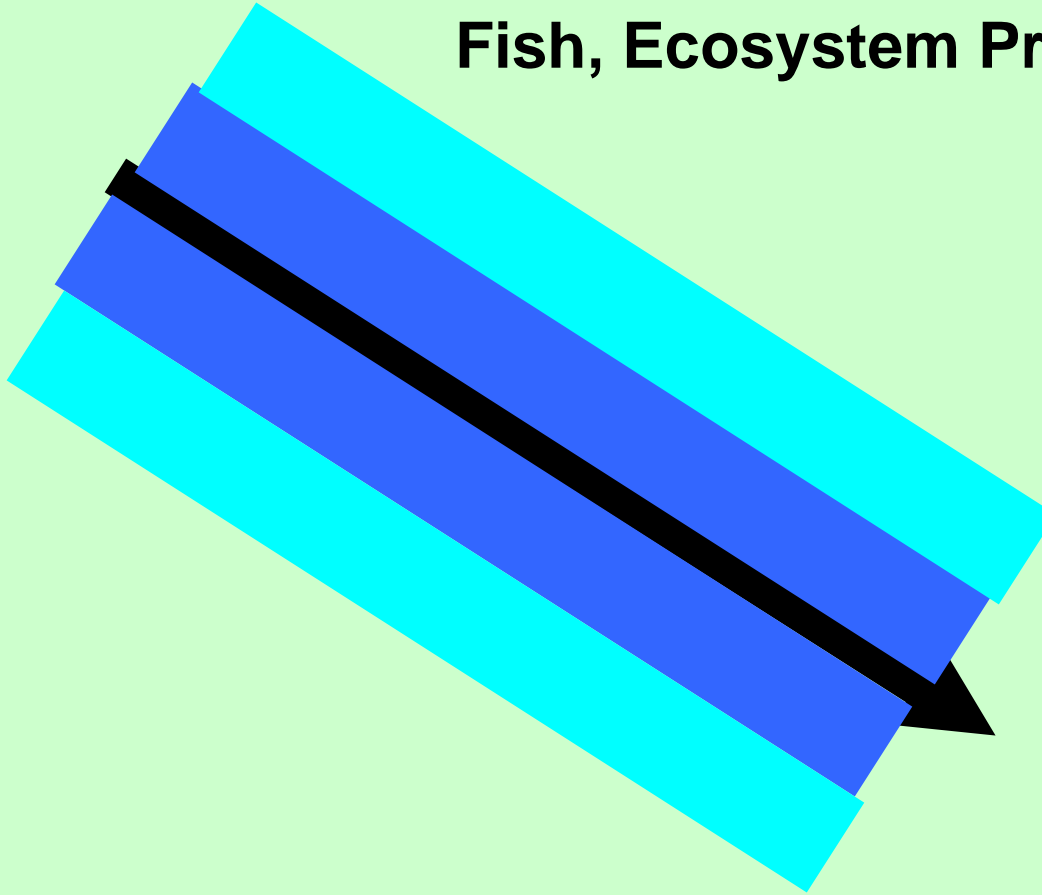




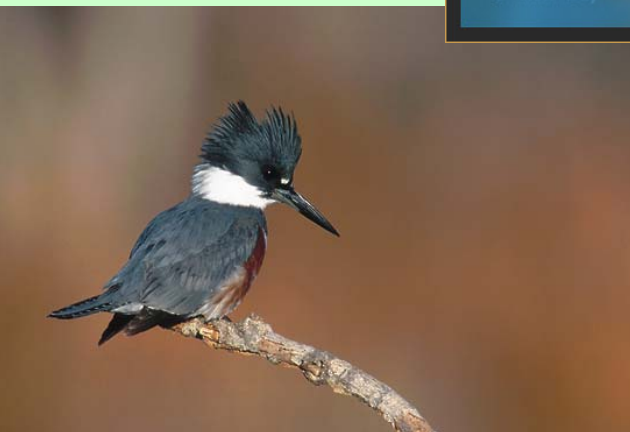
**50' each side:  
Water Quality,  
Water Temperature**



**100' Each Side:  
Fish, Ecosystem Processes**



**Wildlife is another matter!**



# Songbird Habitat Use

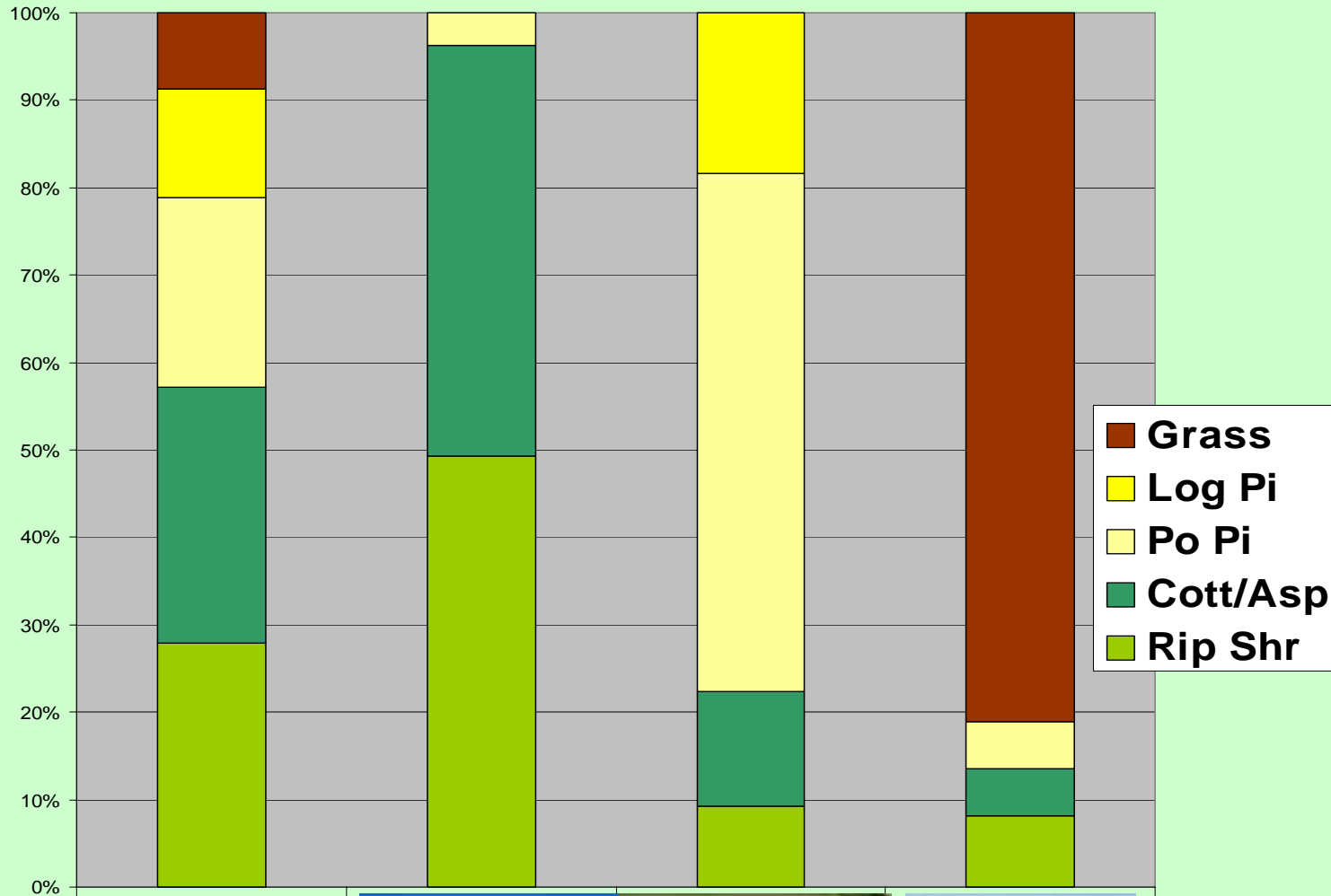
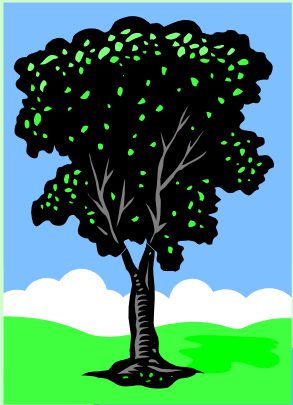


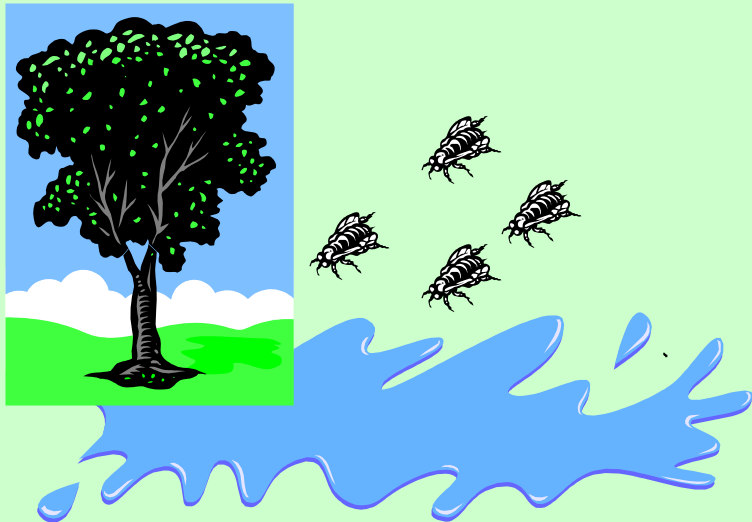
Photo by George Jameson

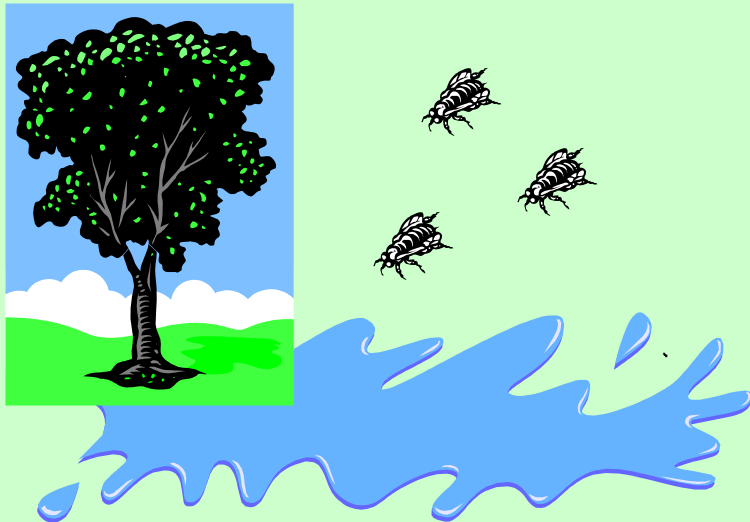


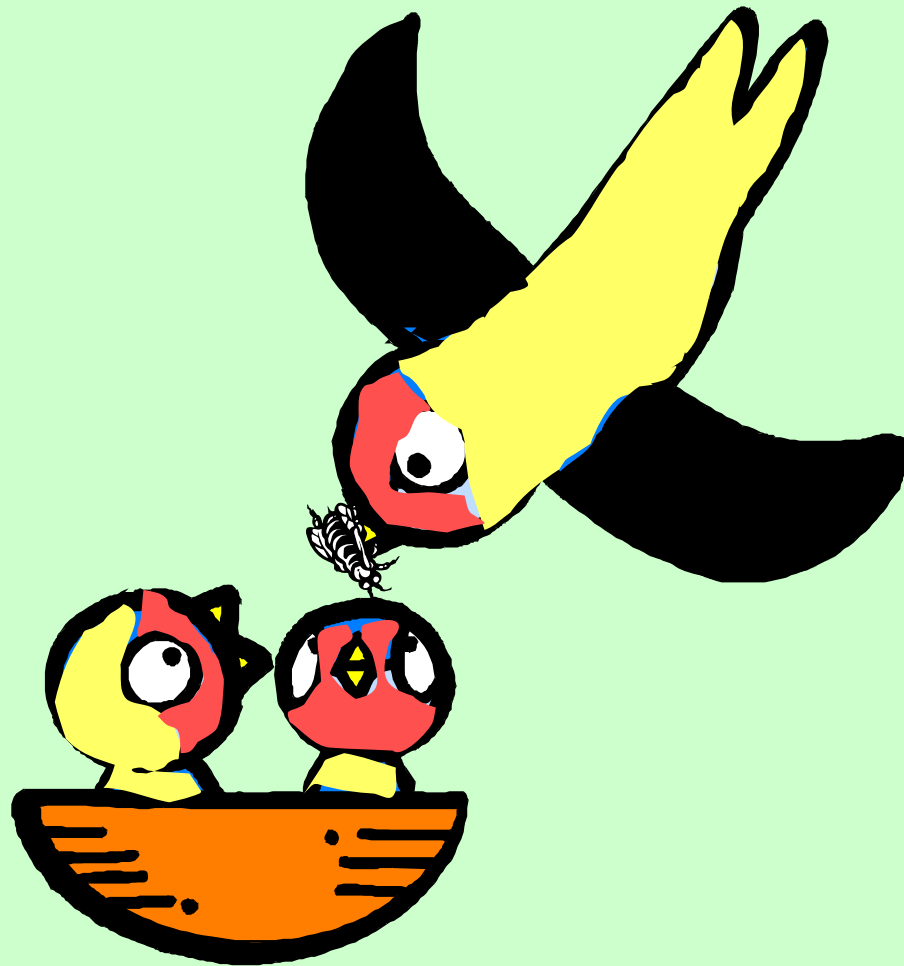


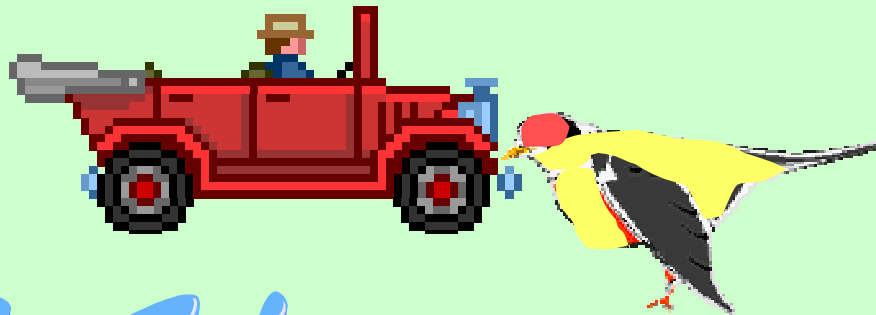
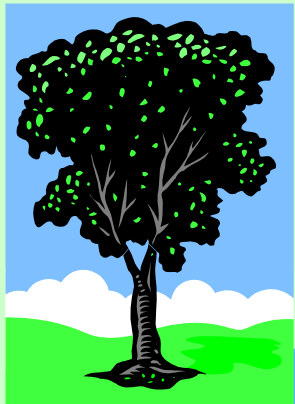












# Stream Corridor

- Stream Channel
- Floodplain
- Transitional Upland Fringe





Fig. 1.10b -- The three major components of a stream corridor in different settings.  
In Stream Corridor Restoration: Principles, Processes, and Practices, 10/98.  
By the Federal Interagency Stream Restoration Working Group, 10/98 (15 Federal Agencies of the US)

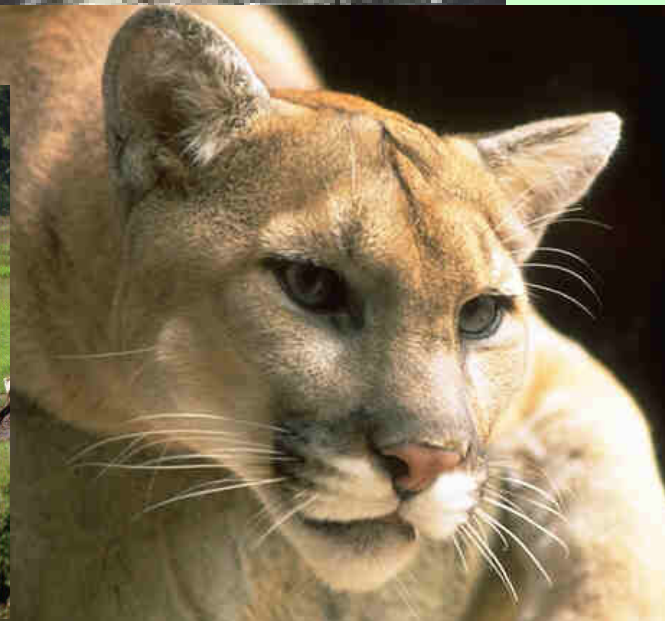
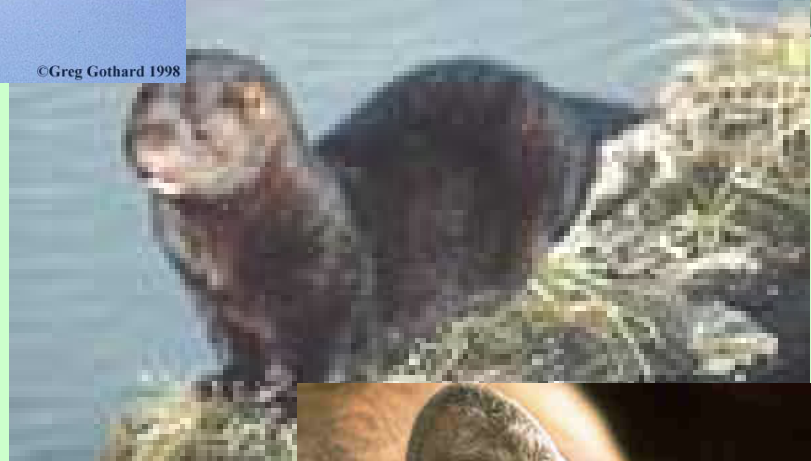


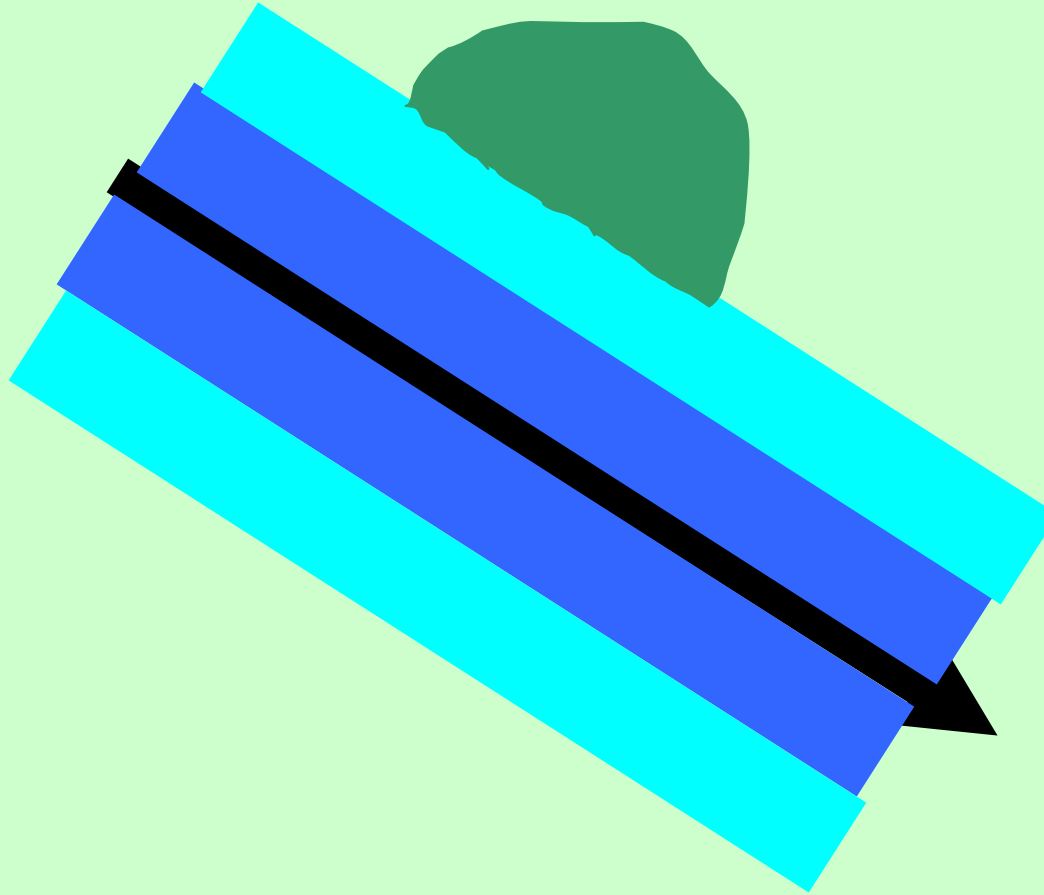
Fig. 1.10a -- The three major components of a stream corridor in different settings.  
In Stream Corridor Restoration: Principles, Processes, and Practices, 10/98  
by the Federal Interagency Stream Restoration Working Group (15 Federal Agencies of the US)





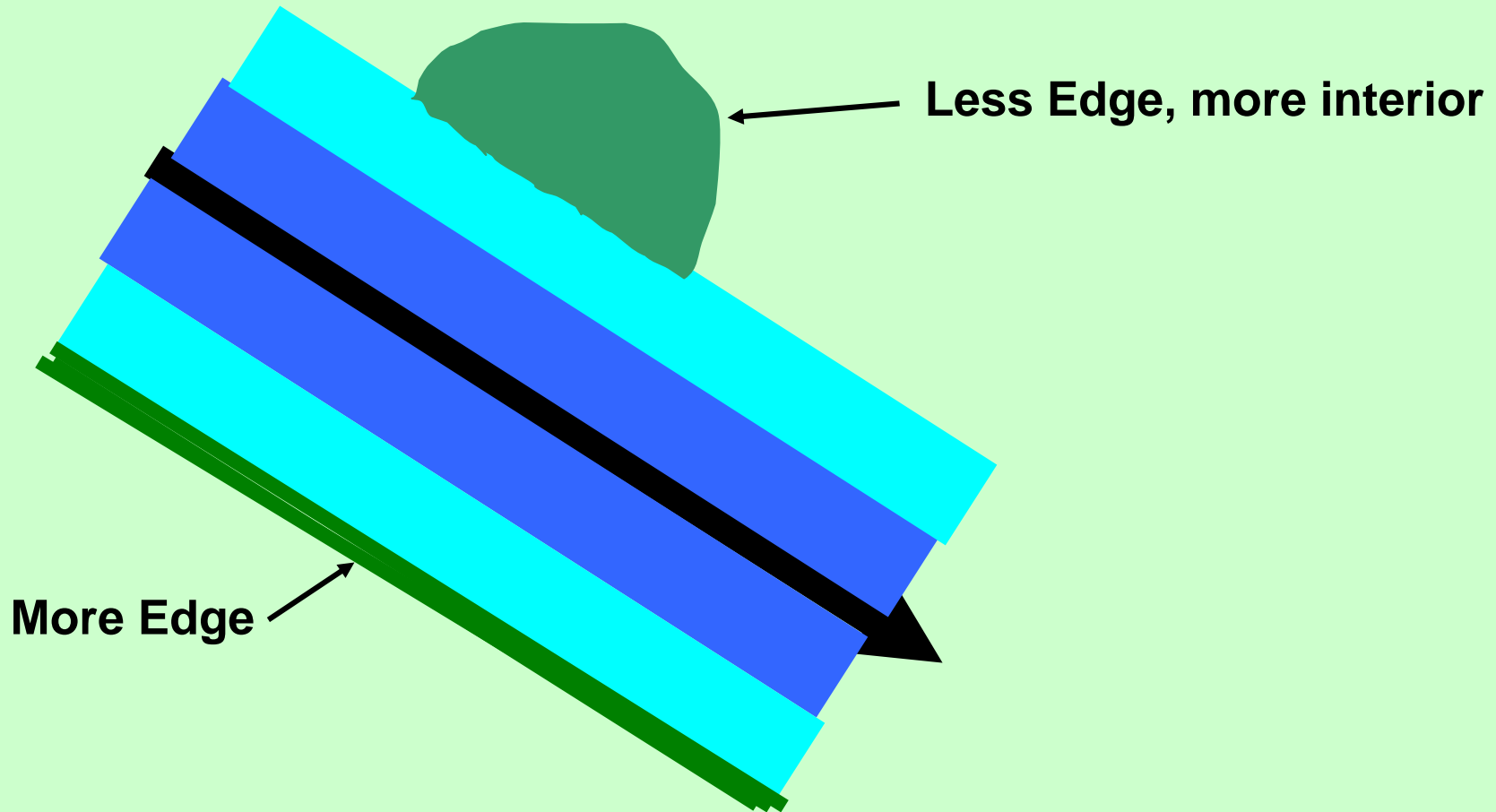
Montana Fish,  
Wildlife & Parks







# “Edge Effect”

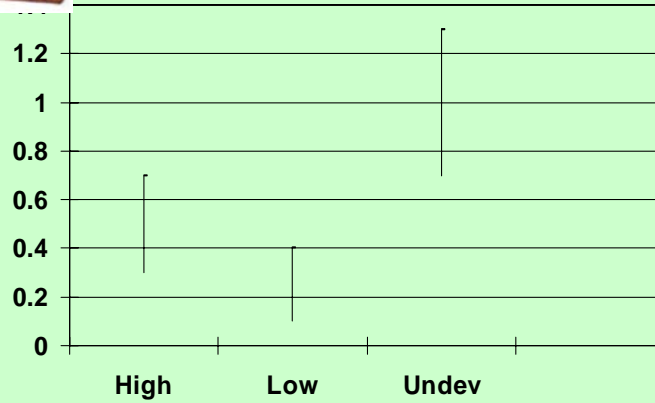


**Urban development near buffers  
Is another consideration for  
Neotropical bird populations and  
other wildlife**

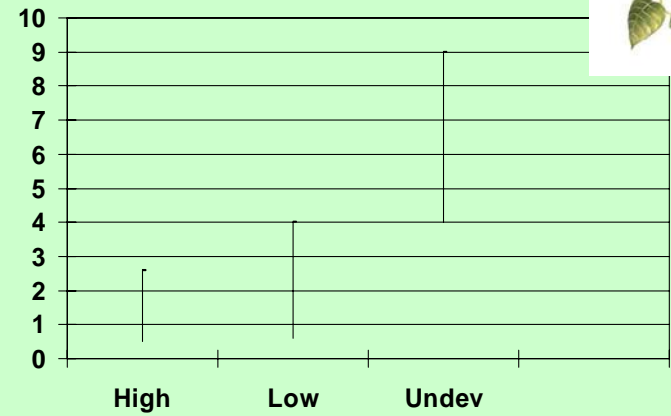




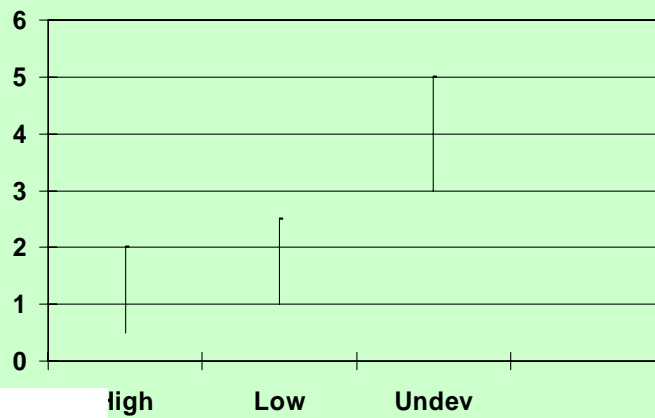
**Black Capped Chickadee**



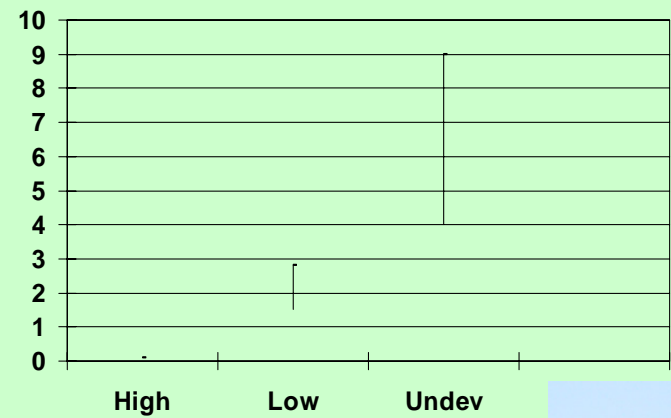
**Blue\_Gray Gnatcatcher**



**Black Headed Grosbeak**



**Dusky Flycatcher**

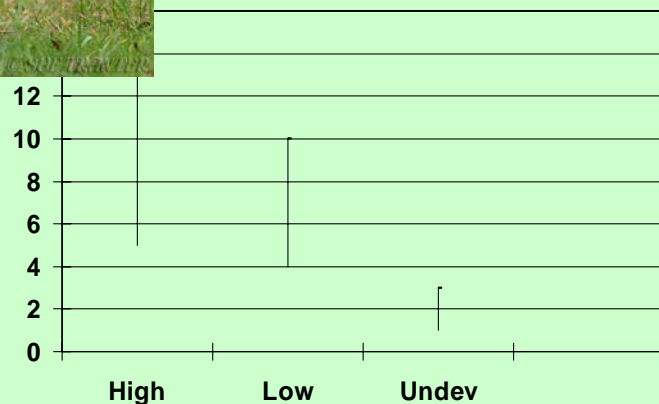


**Development Density**

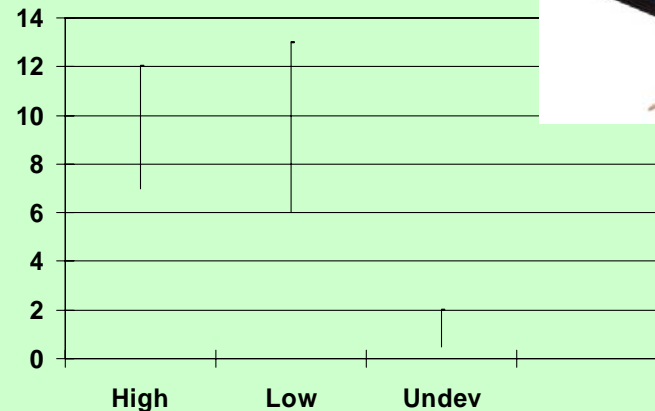




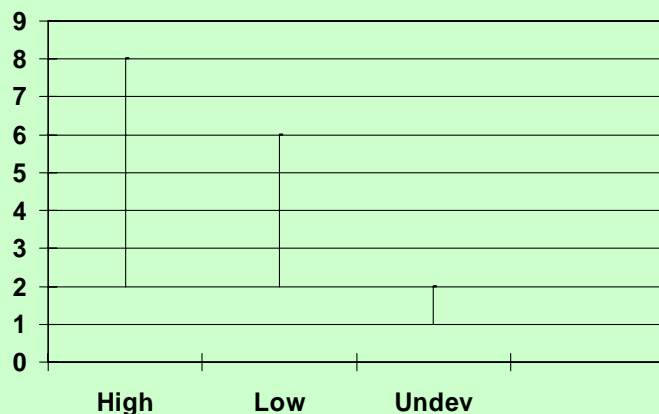
**American Robin**



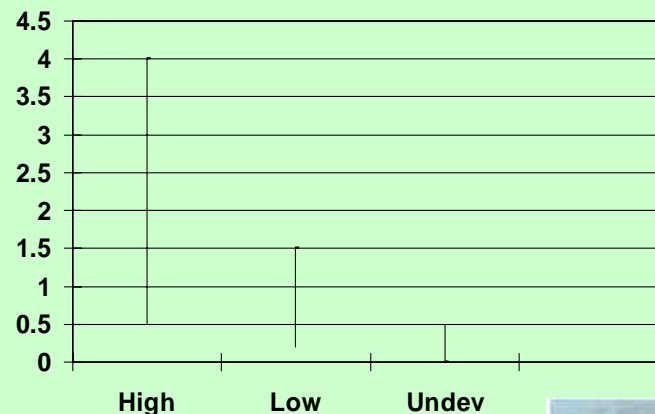
**Black Billed Magpie**



**Brown Headed Cowbird**



**European Starling**



# Development Density



**Density (Birds(Ha)**

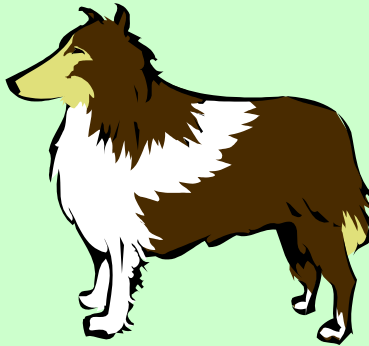




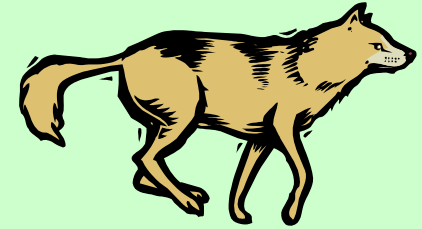




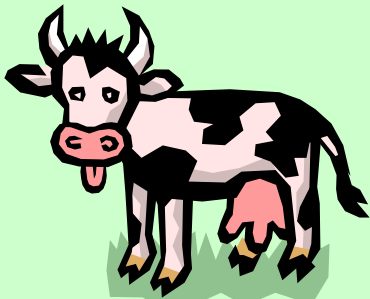
Typical homesite



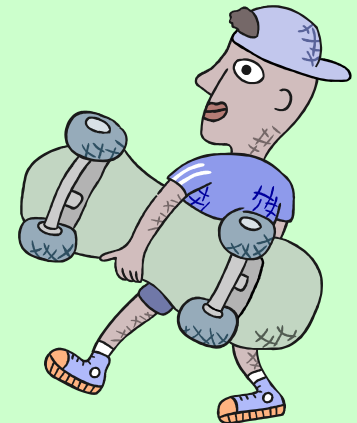
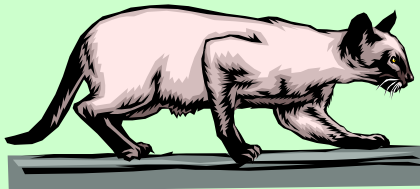
Domestic Pets (predators)



Native predators

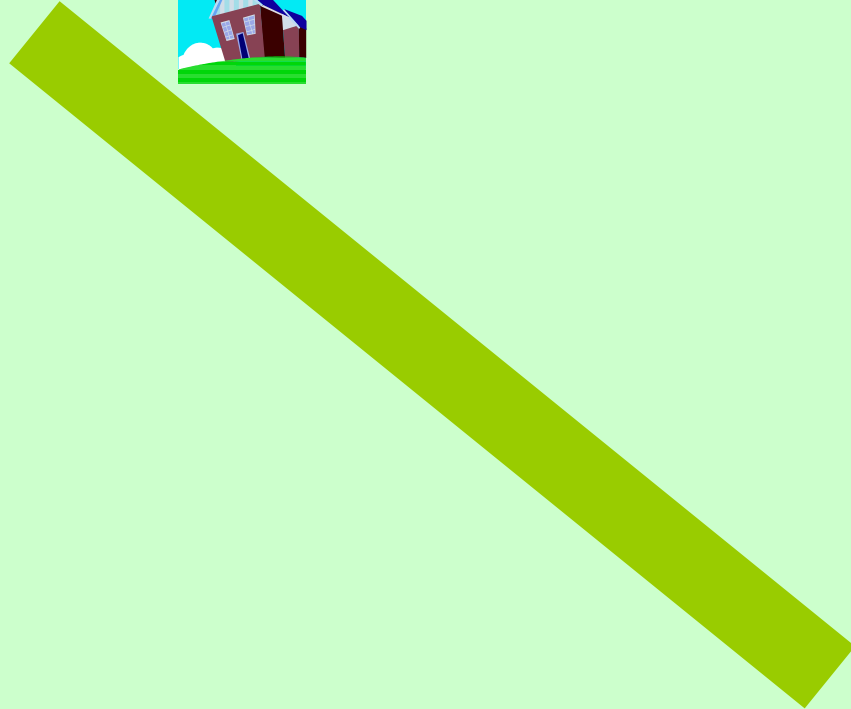
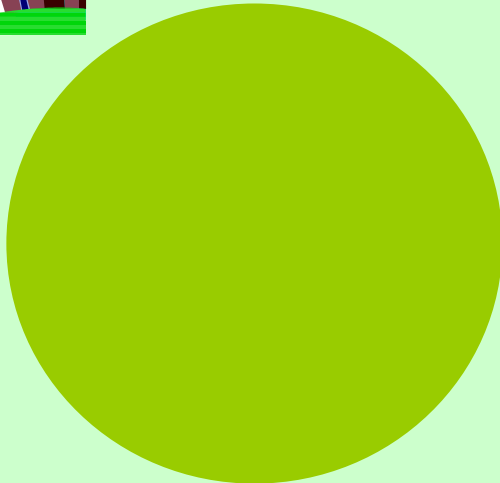


Cowbirds, etc.



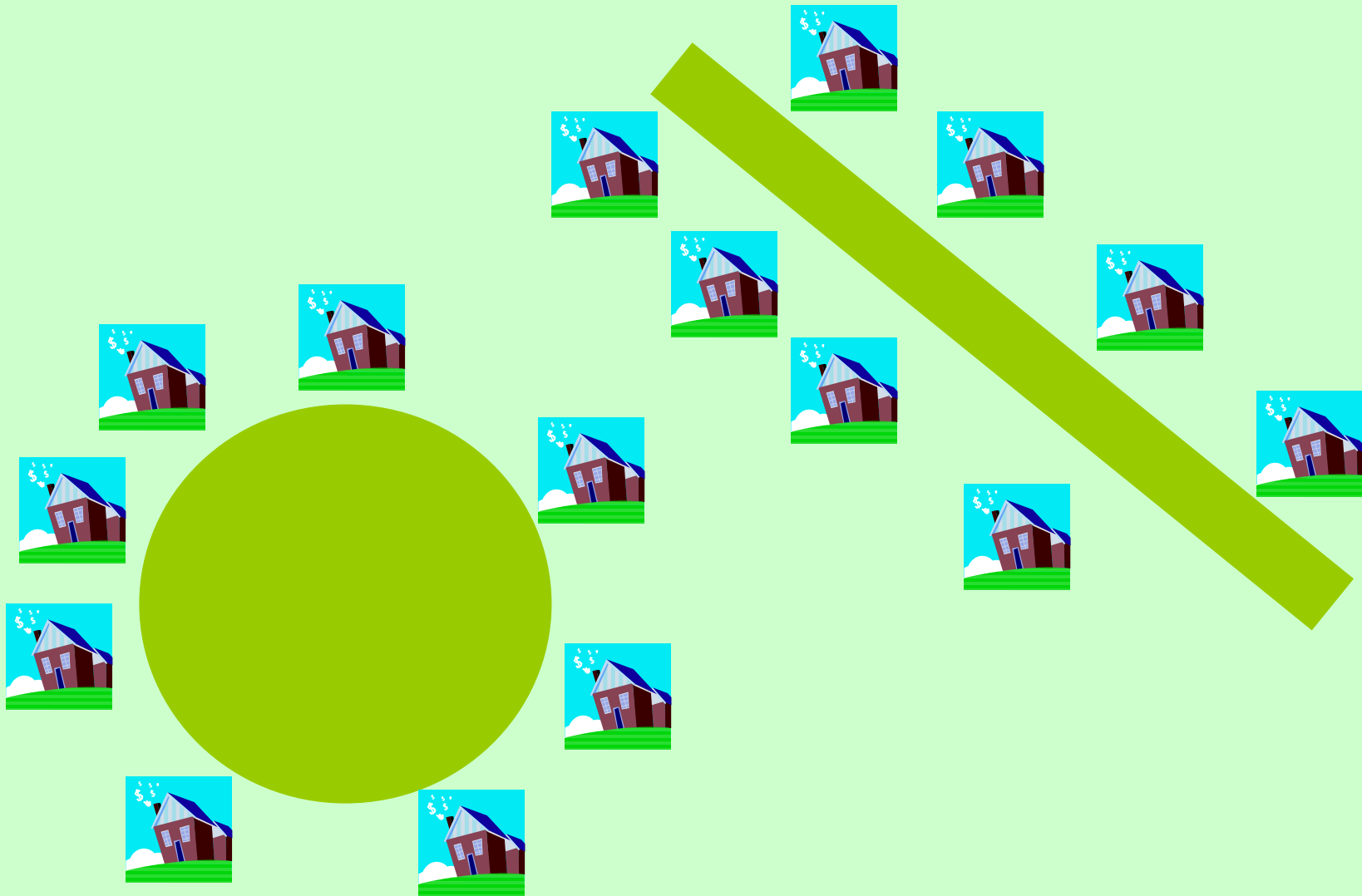
Human predators

# "Edge" Effect

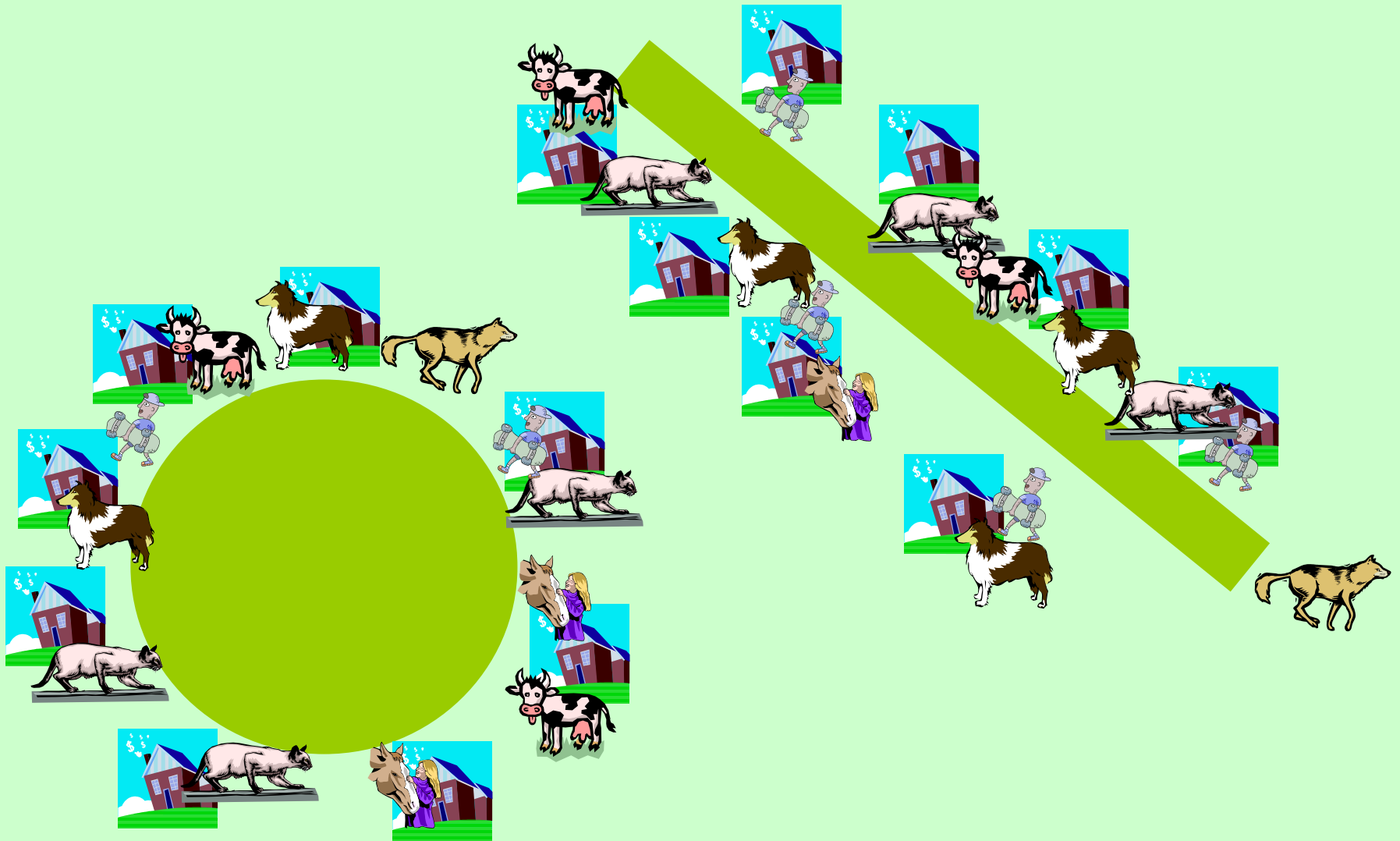




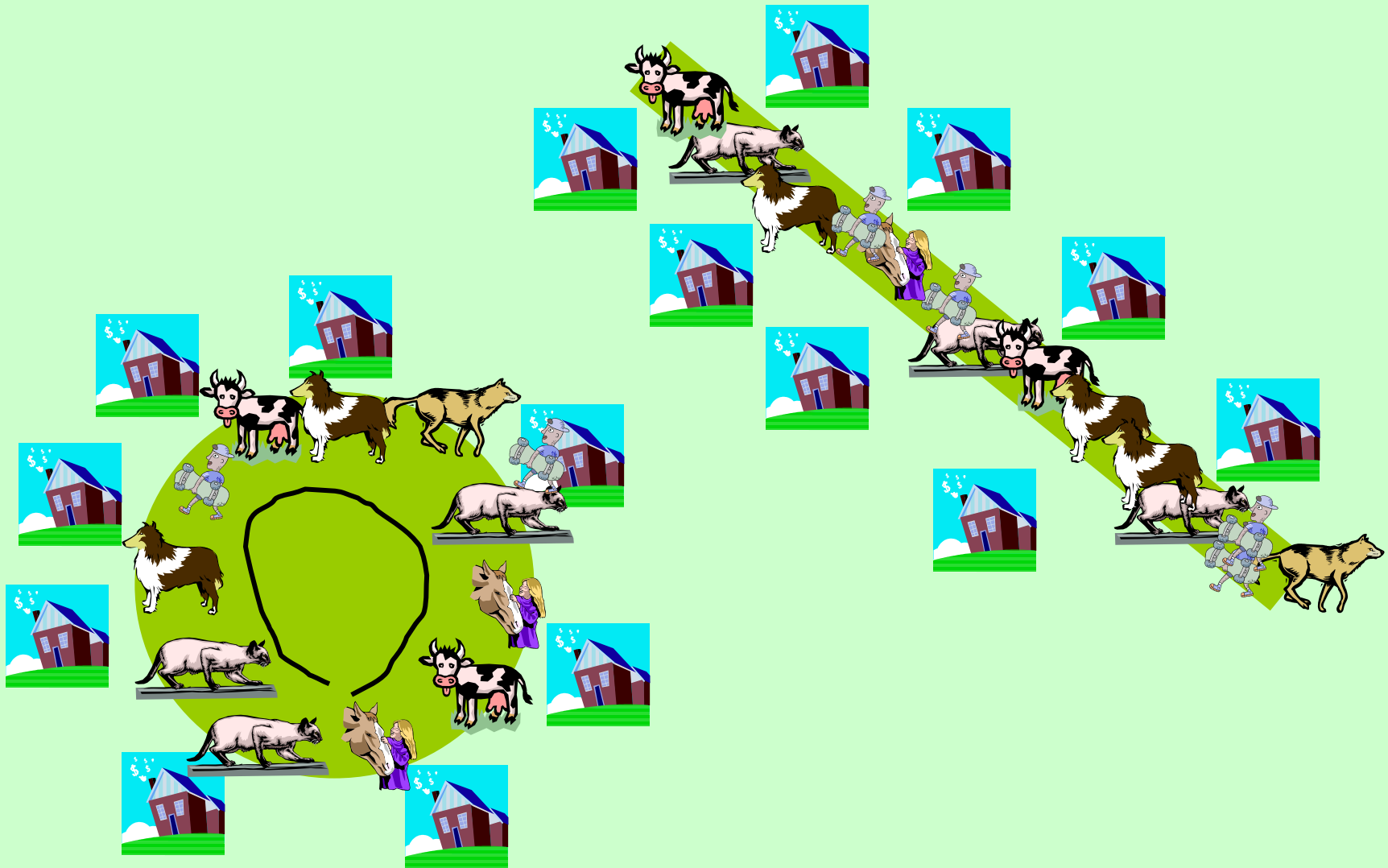
# "Edge" Effect



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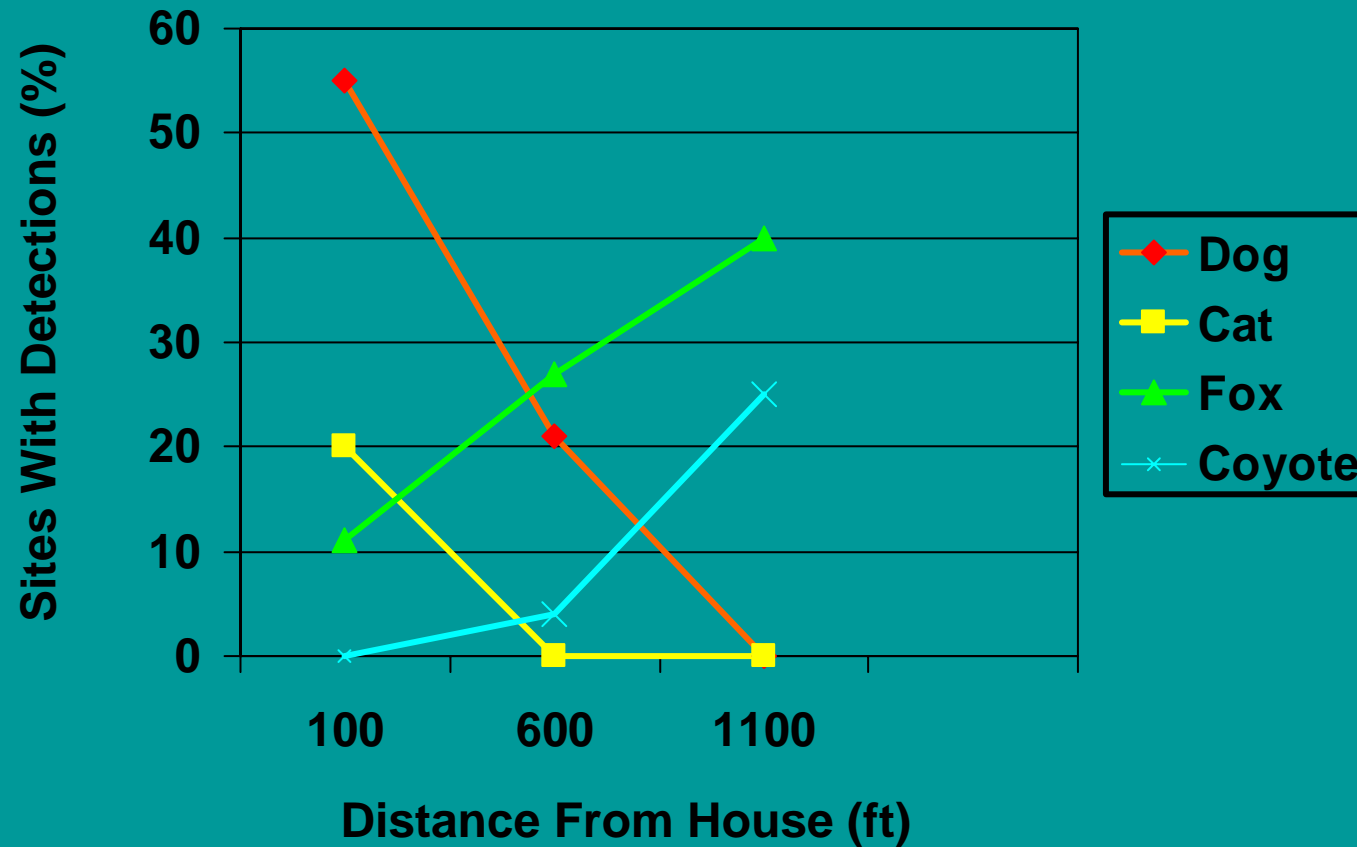


# "Edge" Effect



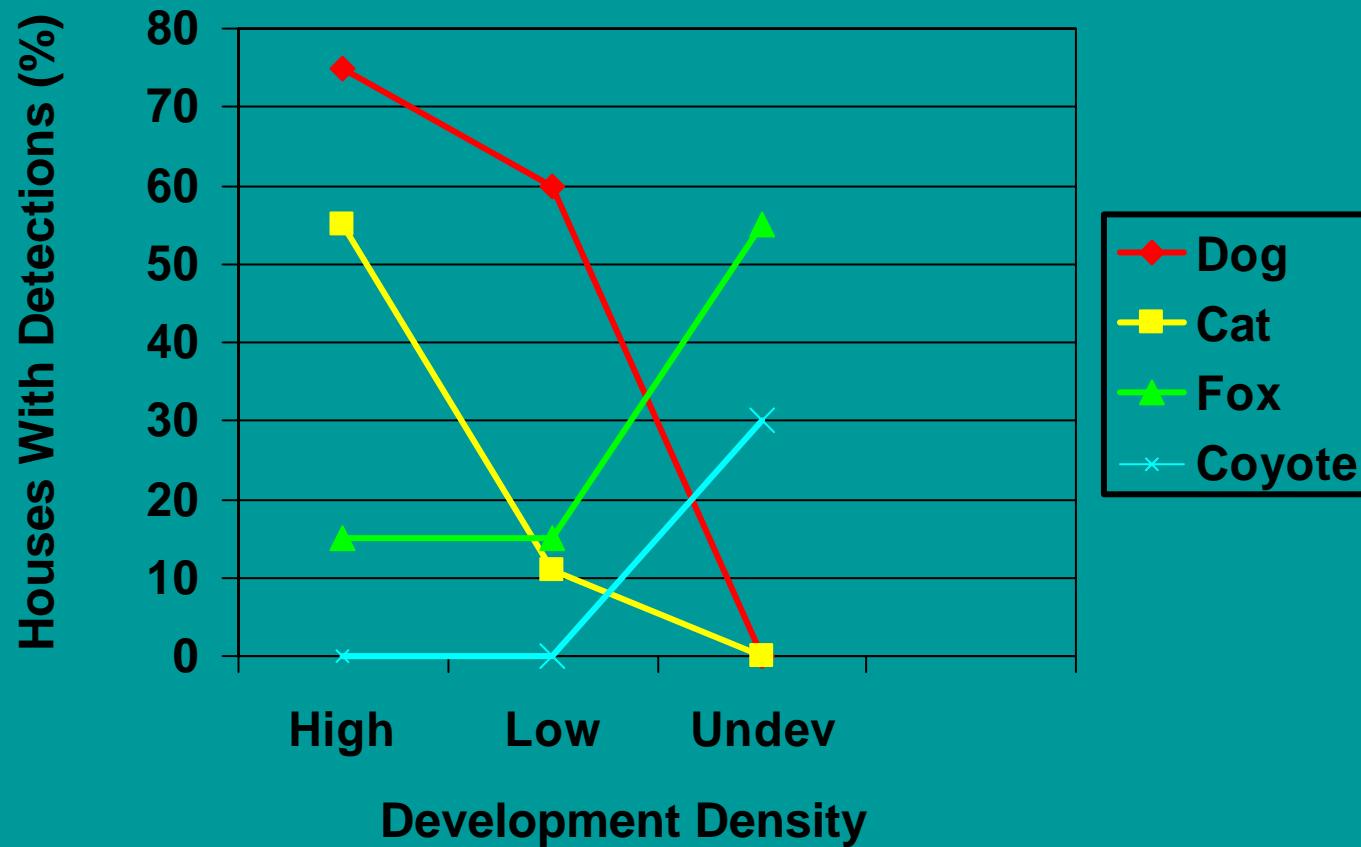
# Percent of Detections

## Western Colorado

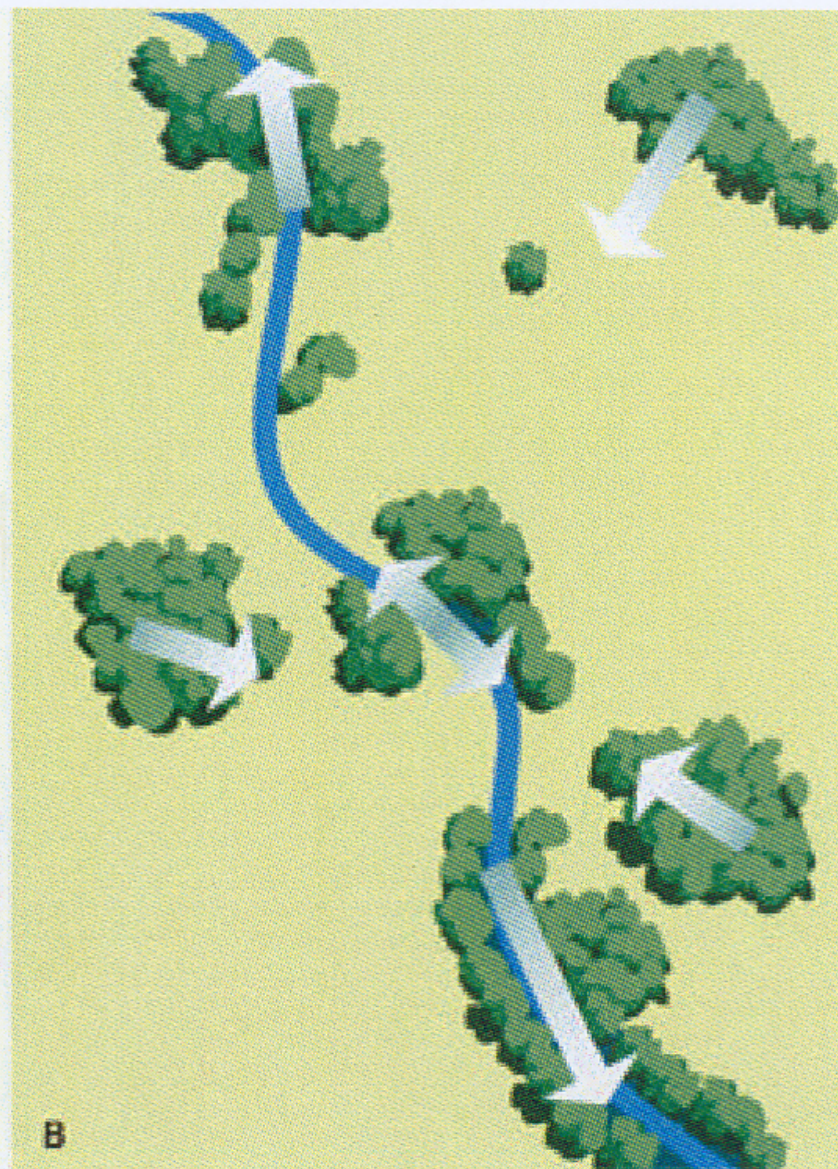
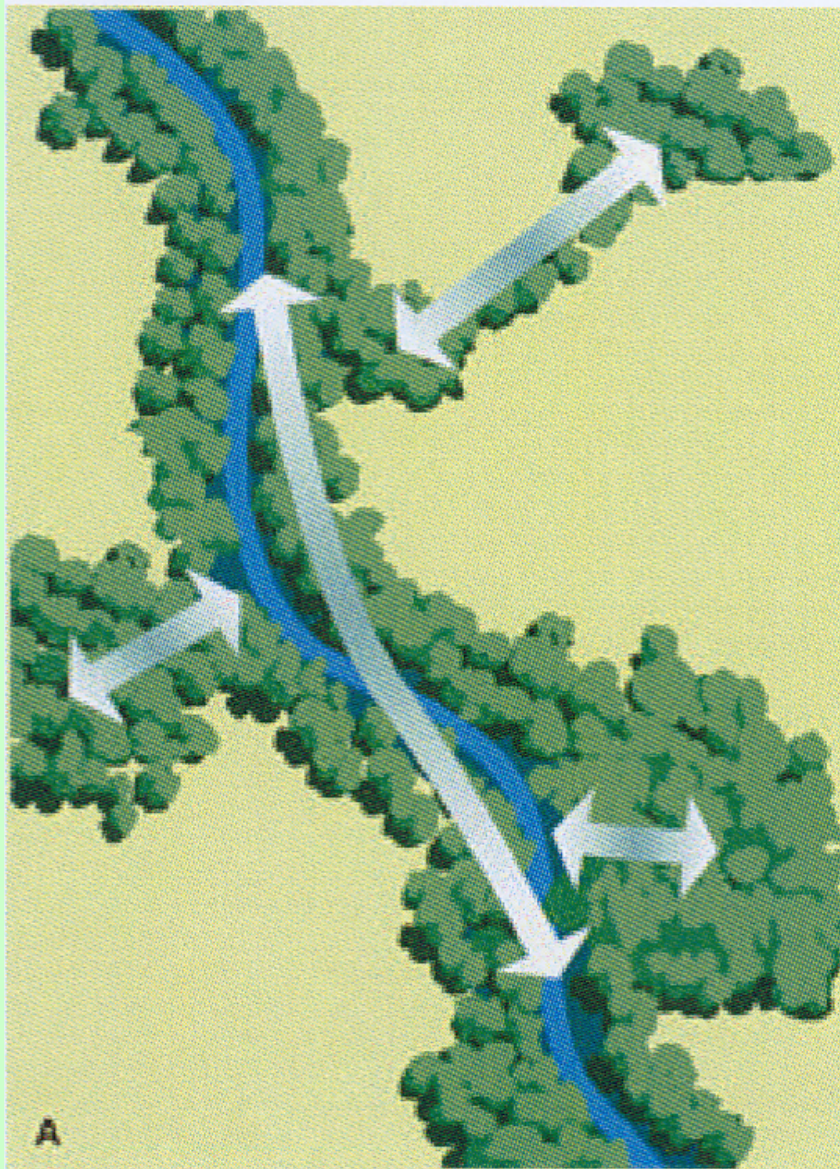


# Percent of Detections

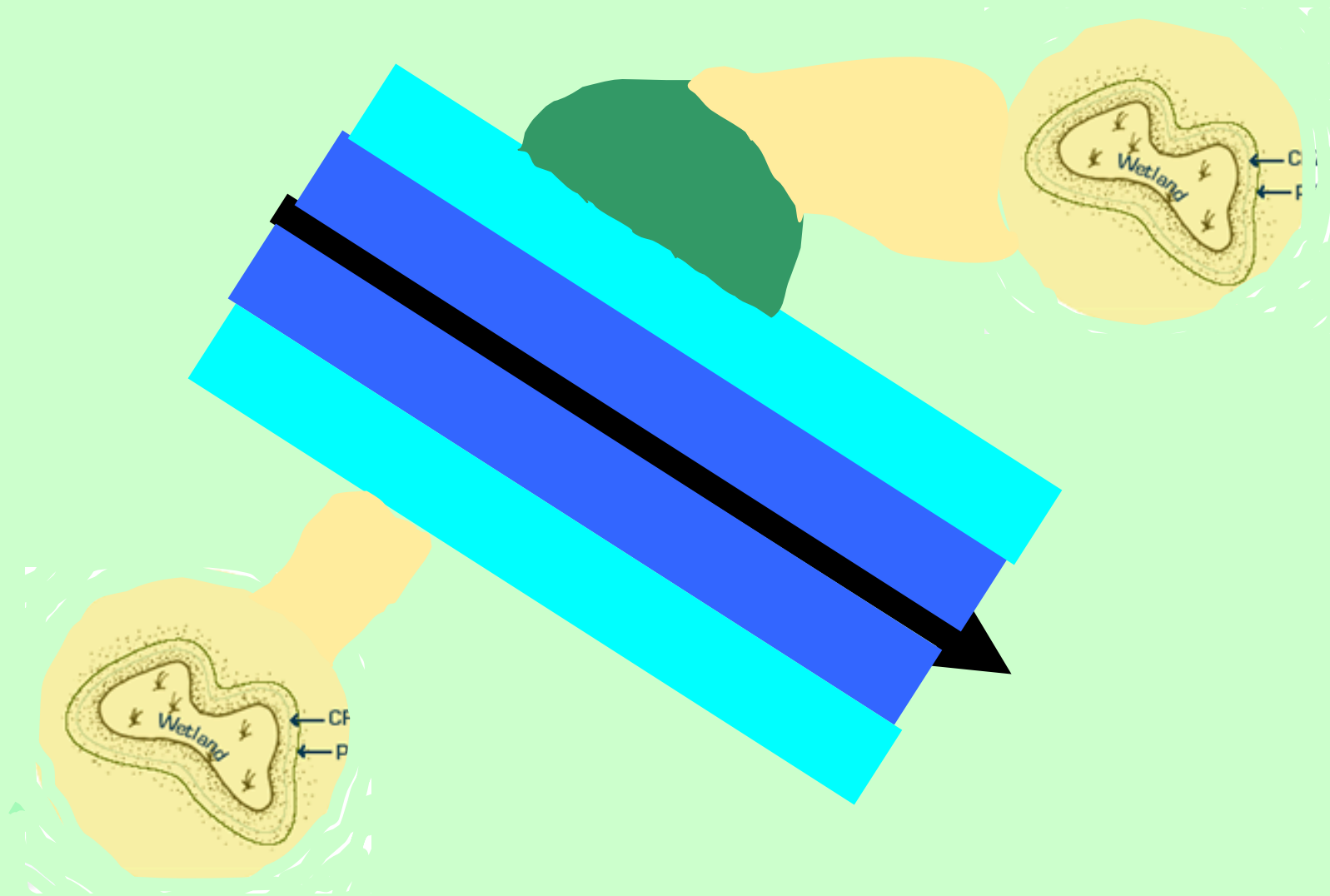
## Western Colorado



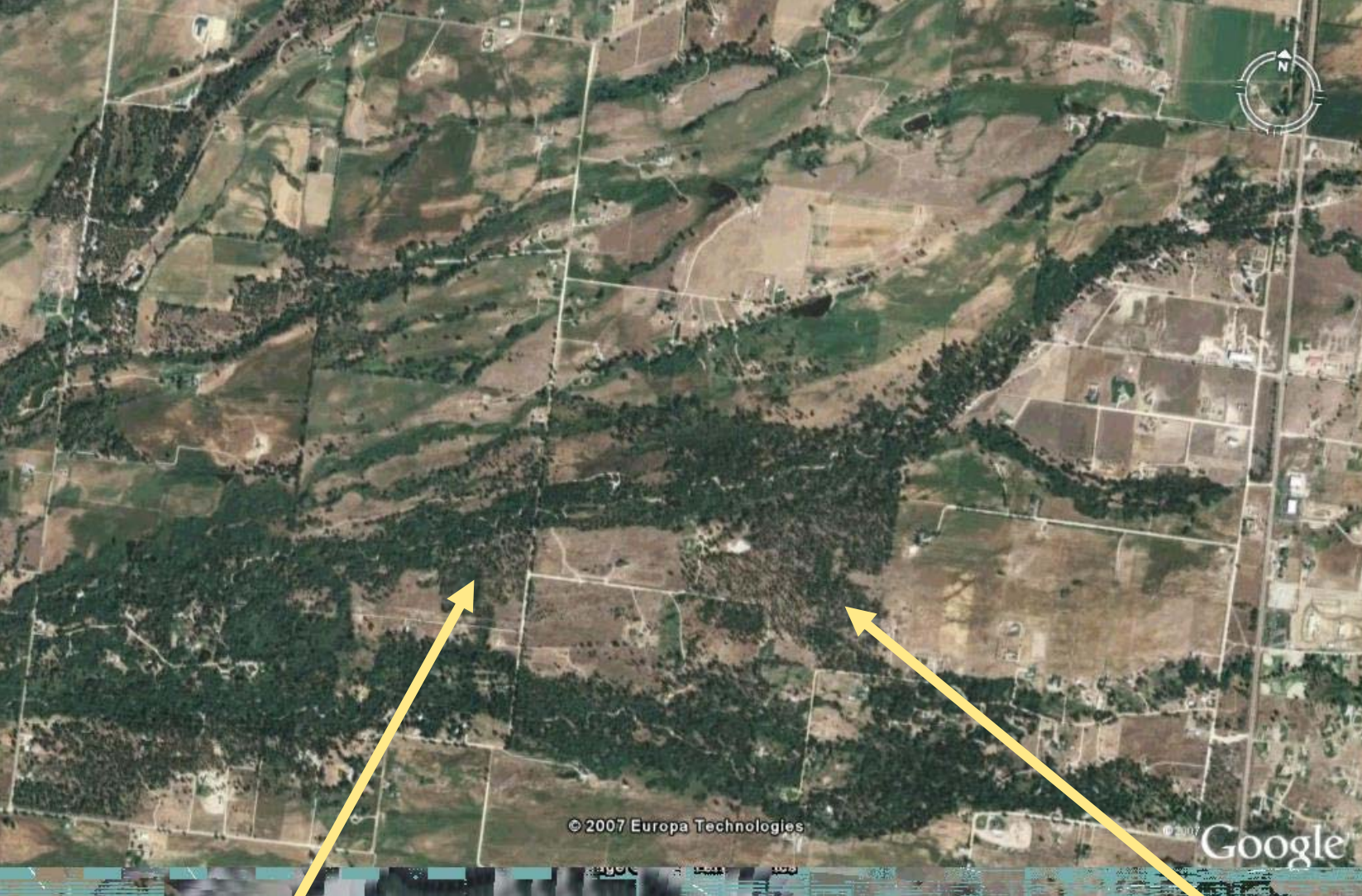








## Wildlife Corridors



**Refuge**

**Corridor**









Stream Corridor

Stream Corridor

Stream Corridor

Google™





Stream Corridor

High Density

Stream Corridor

Stream Corridor

Google™





Stream Corridor  
**Stream Corridor**

Low

High Density

Density

Stream Corridor  
**Stream Corridor**

Stream Corridor  
**Stream Corridor**

Google™





Stream Corridor

Low

High Density

Density

0 100 200 300 400 500 600 700 800 900 1000

Stream Corridor

Stream Corridor

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